BLM

U.S. Department of the Interior
Bureau of Land Management

Final Environmental Assessment

Red Rock Hazardous Fuels Reduction Project

June 25, 2012

DOI-BLM-NV-S000–2011–0002–EA

PREPARING OFFICE

U.S. Department of the Interior
Bureau of Land Management
Southern Nevada District Office
4701 North Torrey Pines Dr.
Las Vegas, Nevada 89130 USA
(702)515–5000

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Chapter 1. Introduction

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Red Rock Canyon's distinction as a "National Conservation Area," states that the Bureau of Land Management (BLM) shall conserve, protect, and enhance the resources characterized by the endemic species and unique desert shrub communities within its boundaries [U. S. Department of the Interior (USDI) BLM 2005]. Red Rock Canyon National Conservation Area (RRCNCA) consists of approximately 198,000 acres and is located in Clark County, Nevada, approximately 15 miles west of the city of Las Vegas. RRCNCA is bordered on the west by the Spring Mountains Range, extends north to the mouths of Lee Canyon and Cold Creek and extends south to include the Bird Spring Range. A substantial portion of the eastern boundary is the western limit of the Summerlin Master Planned Community. Lands immediately adjacent to RRCNCA are now being developed.

RRCNCA has long been a popular location for public recreation and leisure due to unique geological and ecological characteristics occurring in a natural setting so close in proximity to a major population center. The geologic features of the area include an abundance of limestone and sandstone formations, including unique features such as older limestone covering and protecting younger, less weather resistant sandstone. The result is a 3,000 foot escarpment framing the west side of RRCNCA. Along the east side of the Scenic Drive are the Calico Hills, which are another magnificent sandstone formation displaying shades of red, brown, buff, and gray. Weathering has added form and texture, including potholes, domes, and arches.

The Rainbow Mountain Wilderness includes the escarpment along the western border of and extends onto the adjacent Spring Mountains National Recreation Area (SMNRA). The La Madre Mountain Wilderness is north of the Rainbow Mountain Wilderness and the two are separated by the Rocky Gap Road. La Madre Mountain, with the peak elevation recorded at 8,754 feet is the highest point visible in RRCNCA. The lowest elevation occurs along the east boundary of RRCNCA just south of the Lucky Strike Road and is 3,000 feet in elevation.

Water is not a plentiful resource, but due to past geologic fault activity and the permeable strata, RRCNCA contains over 40 springs as well as many tinajas (natural catchment basins). This creates a reliable source of water for wildlife, provides unique ecological environments and allows for higher concentrations of plants and animals than can be found in the surrounding Mojave Desert. Many species of plants and animals are endemic to southern Nevada with some being found only within the Spring Mountains ecosystem.

In addition to the wildlife, RRCNCA is home to wild horses and burros roaming within the Red Rock Herd Management Area (HMA) and is unique with the presence of the wild horses and burros in close proximity to a major metropolitan area.

RRCNCA also offers a wealth of cultural resources from both historic and prehistoric eras. To date, studies have shown the presence of human inhabitants as early as 3,500 B.C. and possibly several thousand years earlier. Some of the cultural resources include shelter caves, roasting pits, rock art (petroglyphs and pictographs) as well as a portion of the Spanish Trail.

1.1. Background

Studies suggest that the Mojave Desert is threatened by the spread of non-native, invasive annual grasses which results in increased fire and loss of natural resources (Brooks 1999). While native grass species in the Mojave Desert generally remain standing for no more than one year, the non-native brome species originating from Eurasia typically persist for many years (Brooks et al. 2007). Standing brome accumulates, providing fine, fire-prone fuels through the summer months

(Brooks 1999). Fine fuels are classified as fast drying fuels that are less than 0.25 inches in diameter. Historically, the Mojave Desert has been characterized as not fire adapted and identified as a Fire Regime IV or V, condition class 1; however, due to the non-native annual grass invasion fire regimes are shifting to resemble a Fire Regime I, condition class 3 (see Appendix E for further description of Fire Regimes). Blackbrush (*Coleogyne ramosissima*) plant communities that primarily compose the landscape in RRCNCA lack the necessary adaptations to recover quickly following severe fire events (Engel and Abella 2011). Whereas many ecosystems may rely or even thrive in response to fire cycles, RRCNCA has experienced slow regeneration and in some areas no recovery following fire events. Local research suggests that recovery is not yet evident even 29 years post fire (Engel and Abella 2011). Within the Mojave Desert wildfires are occurring at historically unprecedented frequencies and extents and have the potential to dramatically change the species composition in affected areas (Brooks and Matchett 2006).

The Proposed Action is to utilize two herbicides to treat and reduce the amount of fine fuels to create fuel breaks on BLM administered land in the RRCNCA.

The areas that are targeted for treatment are characterized as blackbrush and creosote (*Larrea tridentata*) vegetation associations. Studies show that blackbrush desert shrub communities are especially fire intolerant, exhibiting dramatic shifts in plant species composition and minimal blackbrush recruitment following fire (USDI BLM 2005). Historically, the plant community composing the project area was largely recognized for isolated perennial shrubs and cacti species separated by large inter-spaces devoid of vegetation. However, today management has been presented with a new community type. The bare inter-spaces are now covered by dense populations of annual non-native grasses. The shrinking inter-spaces and continuous vegetation has changed fire fuel patterns and significantly increased the extent of fire (Brooks 1999). This predicament has lead researchers and resource managers to explore the issue of altered fire regimes in the Mojave Desert and the potential for an increase in wildfire danger (Reid et al. 2008).

In response to these potential threats the BLM Southern Nevada District Office (SNDO) Office of Fire Management has utilized two modeling programs and gathered data from BehavePlus 4.0.0 and Short Term Fire Behavior Prediction from the Wildland Fire Decision Support System to develop a fuel reduction management strategy to address the concerns for human safety and resource protection at RRCNCA. This Environmental Assessment (EA) provides fuel reduction treatment alternatives to address the current potentially hazardous conditions at RRCNCA.

Figure 1.1. Post-fire landscape following the 2005 Loop Fire.

1.2. Brome

There have been five brome species documented within RRCNCA: cheatgrass (*Bromus tectorum*), red brome (*Bromus rubens*), California brome (*Bromus carinatus*), smooth brome (*Bromus inermis*) and ripgut brome (*Bromus diandrus*). The brome species of greatest concern in RRCNCA are red brome and cheatgrass (USDI BLM 2005). Red brome and cheatgrass are winter annuals, typically germinating from fall rains, growing during the Mojave Desert cool season and setting seed in the spring. These invasive annuals can germinate from minimal moisture (0.5 inches), whereas Mojave Desert natives have a germination threshold twice that (Beatley 1966). Even in drought years a few productive individuals will be noted (Beatley 1966). Red brome extracts soil moisture faster than native Mojave Desert annuals (DeFalco et al. 2003). Cheatgrass seed production is linked to available resources, with individuals in dense stands producing 25 seeds and open growing individuals producing 400 seeds. One study found that individuals that were mowed before producing seed typically recovered to produce seed later (Hulbert 1955).

1.3. Identifying Information:

1.3.1. Title, EA number, and type of project:

Red Rock Canyon Hazardous Fuels Reduction Project

DOI-BLM-NV-S000–0002–EA

Project Type: Hazardous Fuels Reduction

1.3.2. Location of Proposed Action:

Table 1.1. Proposed Spray Locations

Geographic Description	Mount Diablo Prime Meridian
Red Rock Canyon Visitor Center and Fee Booth Area	T.21S.,R.58E., section 12. T.21S.,R.59E., section 7.
Blue Diamond	T.22S.,R.59E., sections 7 & 8.
Red Rock Canyon Fire Station	T.21S.,R.59E., section 8.
Calico Basin	T.21S.,R.59E., section 6.
Moenkopi Campground and Extension on Moenkopi Road	T.21S.,R.59E., sections 9 & 16. T.21S.,R.59E., section 15.
Nevada State Route (SR) 159	T.21S.,R.59E., sections 7 & 8. T.21S.,R.58E., sections 12-14, 23, 26 & 35. T.22S.,R.58E., sections 1, 2 &12. T.22S.,R.59E., sections 7&9.
Scenic Drive	T.20S.,R.58E., sections 33-35. T.21S.,R.58E., sections 1-4, 10, 12, 14, 15 & 23.
Moenkopi Road	T.21S.,R.59E., sections 8 & 9.
Rocky Gap Road	T.20S.,R.58E., sections 32-33. T.21S.,R.58E., section 4.
Cowboy Trail Rides Road	T.21S.,R.58E., sections 13 & 24. T.21S.,R.59E., section 19.
Un-named road to Blue Diamond Mine on east side of Nevada (SR) 159 north of Blue Diamond Village	T.22S.,R.59E., sections 6 & 7. T.21S.,R.59E., section 31.
Oak Creek South	T.21S.,R.58E., sections 21-23.
Pine Creek	T.21S.,R.58E., sections 15 & 16.
Unnamed trail between First Creek and Spring Mtn. State Park entrance	T.21S.,R.58E., sections 33-35.
2005 Loop Fire (858 acres)	T.21S.,R.58E., sections 1, 2, 11 & 12.
2006 Scenic Fire (1611 acres)	T.21S.,R.58E., sections 10-15 & 23.
2007 Bonnie Springs (389 acres)	T.21S.,R.58E., sections 23 & 24.
2005 Overlook (61 acres)	T.21S.,R.58E., sections 13 & 24.
2005 Diamond (119 acres)	T.21S.,R.59E., sections 16, 17, 20 & 21.
East-West within Scenic Loop Drive (north)	T.20S.,R.58E., section 34.
East-West within Scenic Loop Drive (south)	T.21S.,R.58E., sections 11 & 12.
Un-named wash on east side of Nevada State Route (SR) 159, between Spring Mtn. State Park entrance and First Creek Trail Head on west	T.21S.,R.58E., sections 35 & 36.
Bonnie Springs entrance road and wash south to Nevada State (SR) 160	T.22S.,R.58E., sections 1, 2, 11, 13, 14 & 24.

RRCNCA south of Kyle Canyon Rd. and north of Highway 160. Total area of Proposed Project is 4,460 acres.

1.3.3. Name and Location of Preparing Office:

Bureau of Land Management

Southern Nevada District Office

4701 North Torrey Pines Dr.

Las Vegas, NV 89130

(702) 515–5000

1.3.4. Identify the subject function code, lease, serial, or case file number:

LLNVS00540

1.3.5. Applicant Name:

Bureau of Land Management, Southern Nevada District Office, Office of Fire Management.

1.4. Purpose and Need for Action:

The purpose of the Proposed Action is to reduce the threat of unwanted wildland fire in RRCNCA due to invasive annual grasses by chemical herbicide, mechanical mowing, or mechanical blading treatments. The Proposed Project would reduce the population of non-native invasive annual grasses and their soil seed bank, ultimately reducing hazardous fuels on BLM administered land in the RRCNCA. With more than one million visitors each year and all vehicular traffic utilizing the one-way, Scenic Drive, site evacuation and public safety in light of wildfire are of significant concern. As illustrated through past wildfires in RRCNCA [Loop, Diamond and Overlook (2005), Scenic (2006) and Bonnie Springs (2007)] the fire regime has been altered to an unnatural "annual grass/fire cycle." The management goal for the treatment is to reduce the potential for catastrophic wildfire in RRCNCA by strategically reducing fuel loads. The need for the Proposed Action is to reduce the invasive annual grasses that significantly increase wildland fire fuel loading, and contribute to an unnatural "annual grass/fire cycle."

Decision to be made: The BLM will decide whether or not to apply one or a combination of the following fuel reduction treatments: chemical herbicide, mechanical mowing, or mechanical blading, to specific areas within the RRCNCA, and if so, under what terms and conditions.

1.5. Scoping, Public Involvement and Issues:

BLM conducted internal scoping and identified potential issues in the following resources:

- Air Quality
- BLM Sensitive Plant Species
- BLM Sensitive Wildlife Species
- Floodplains
- Fuels/Fire Management
- Human Health and Safety
- Hydrologic Conditions (Including Water Quality)
- Invasive Species/Noxious Weeds
- Migratory Birds

- Recreation
- Socio-Economics
- Soils
- Threatened, Endangered or Candidate Species
- Vegetation Excluding Federally Listed Species
- Visual Resources
- Wetland/Riparian
- Wild Horses/Burros
- Wilderness
- Wildlife Excluding Federally Listed Species

This Proposed Project was scoped by the U.S. Fish and Wildlife Service (USFWS) for the formal Section 7 Consultation pursuant to the Endangered Species Act (ESA) of 1973.

Announcements and Media Releases

On January 25, 2012 a news release was provided to the southern Nevada and the local congressional media list informing the public of the scoping meetings and the opportunity to provide comments. Postcards from the RRCNCA interested parties mailing list were sent inviting interested parties to attend the public scoping meetings and provide comments on the Red Rock Hazardous Fuels Reduction Project. Additionally, the meeting date, times and location were posted on the BLM SNDO Web site (www.blm.gov/nv/st/en/fo/lvfo.html) and the RRCNCA Web site (www.blm.gov/nv/st/en/fo/lvfo/blm_programs/blm_special_areas/red_rock_nca.html).

Public Meetings

The Draft EA was available for public comment from January 25 through February 27, 2012. The BLM held two public meetings (afternoon and evening) on February 8, 2012 at the RRCNCA Visitor Center. Both public meetings began with a brief presentation of the project area, purpose of and need for the action, and the alternatives. Additionally, posters summarizing the project area, treatment locations, fire behavior modeling, and an overview of the National Environmental Policy Act (NEPA) process were displayed for public review. BLM representatives were available to answer questions. Project fact sheets, comment cards and a court reporter were provided at each meeting. In accordance with BLM requirements, sign-in sheets were provided and attendees were encouraged to sign in. Not everyone in attendance signed the sign-in sheet. Three people attended the afternoon session and seven people attended the evening session. Comment cards and the court reporter were provided so members of the public could submit comments regarding issues or concerns of the proposed project. Comment cards could be submitted at the meeting, or mailed, e-mailed, or faxed to the BLM Southern Nevada District Office. The BLM received five e-mailed and four mailed comment letters (see Appendix A for comments and responses). Forty-five comments were received, three of which were in support of the project as proposed. Additional issues raised were in regards to project worker education and public access to Material Safety Data Sheets (MSDSs) of the two proposed herbicides. Some comments were not incorporated into the

final EA as they are already addressed in existing planning documents or policy, or were beyond the scope of this project. The issues raised were incorporated into the proposed action as follows:

- The Nevada Department of Wildlife (NDOW) banded Gila monster (*Heloderma suspectum cinctum*) protocol will be incorporated as part of project worker education.
- MSDSs will be available, for the public, at both the RRCNCA Visitor Center and the SNDO.

Chapter 2. Proposed Action and Alternatives

2.1. Description of Alternative A: (Proposed Action)

The Proposed Action is to utilize two herbicides to treat and reduce the amount of non-native, invasive annual grasses and their seed bank to create fuel breaks on BLM administered land in the RRCNCA.

The BLM proposes to use commercially available pre-emergent and/or post-emergent herbicides in an ongoing effort to reduce invasive annual grasses by creating 300 foot wide fuel breaks intended to interrupt the "annual grass/fire cycle" and release existing desirable native plant communities from the competitive pressure of undesirable non-native plant species. Imazapic (trade name Plateau®) would be used as a pre-emergent herbicide applied at least 48 hours after sufficient cool season (September-February) precipitation but before brome emergence at a maximum rate of 8 ounces per acre per year.

Results of a study released by BASF and Synergy Resource Solutions Inc. indicate that fire intensity can be significantly reduced in cheatgrass-infested areas treated by Plateau® (Kury et al. 2002). The study found that flame height in treated areas can be reduced by 68 to 88 percent and fire spread can be minimized by 78 to 95 percent allowing for control with hand tools. Similar results would be expected with other appropriate herbicides.

In similar cool-season weather conditions during the early stages of plant growth (before seed production), Imazapic would be combined with the post-emergent herbicide Glyphosate (trade name Journey®) and applied at a maximum rate of 32 ounces per acre per year. Post-emergent application would be during the early stages of growth when the weeds are growing vigorously. Only one herbicide formulation would be applied per year to a treated acre. After the initial treatment additional treatments would not occur during years of drought when few non-native annual grasses are expected to germinate.

Plateau® (U. S. Environmental Protection Agency (USEPA) Reg. No. 241-365), and Journey® (USEPA Reg. No. 241-417) are federally approved herbicides included in the Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS) and Record of Decision (ROD) (2007). All label instructions would be strictly adhered to.

Additional chemicals would be added to these herbicides to aid in the application. Methylated seed oil, such as MSO® Concentrate would be added to the herbicide at a maximum rate of 32 ounces per acre, to act as an adjuvant that modifies the action of an agrichemical or the physical characteristics of the mixture. A drift inhibitor such as Liberate®, within the maximum rate of 8 pints per 100 gallons, may be added to the herbicide mixture to produce a more uniform spray pattern of the solution in order to aid in penetration, improve deposition, and retard drift. Again, all label instructions would be strictly adhered to.

The proposed treatment areas for Plateau® would be linear strips adjacent to existing corridors such as the Scenic Drive and hiking trails, and along but not within terrain features such as washes. Treatments along roads, trails, and natural features would be applied at a width of 150 feet on both sides of the features, thus creating at least 300 foot wide fuel breaks (See map. 2.1).

The area of State Route 159 on the northern end of Blue Diamond and running south to the intersection of State Route 160 would be treated 300 feet out from just the east roadside to avoid washes, on the west side, with the potential to provide habitat for yellow two-tone beardtongue (*Penstemon bicolor* ssp. *bicolor*) a BLM Sensitive Plant Species and USFWS Species of Concern.

Washes within the project area are the documented habitat of this species of penstemon endemic to the region. Project avoidance measures such as removing the northern section of the Scenic Drive from treatment areas, and treating 300 feet out from just the east side of a portion of State Route 159 (T. 20S, R. 58E Sect. 34), are intended to preserve populations of the unique penstemon species.

Herbicide treatments adjacent to infrastructure would create 300 foot buffers around buildings. Treatments along fire scars with Plateau® and/or Journey® would initially be 300 feet inside the scar to avoid disturbing unburned areas and to prevent a fire start inside the non-native mono-culture from escaping to a previously unburned area. This area of linear treatment within fire scars accounts for 692 acres. In addition, Journey® would be applied inside existing fire scars, in those areas where inter-spaces have essentially converted to non-native mono-cultures. Existing fire scars encompass 3,038 acres and include:

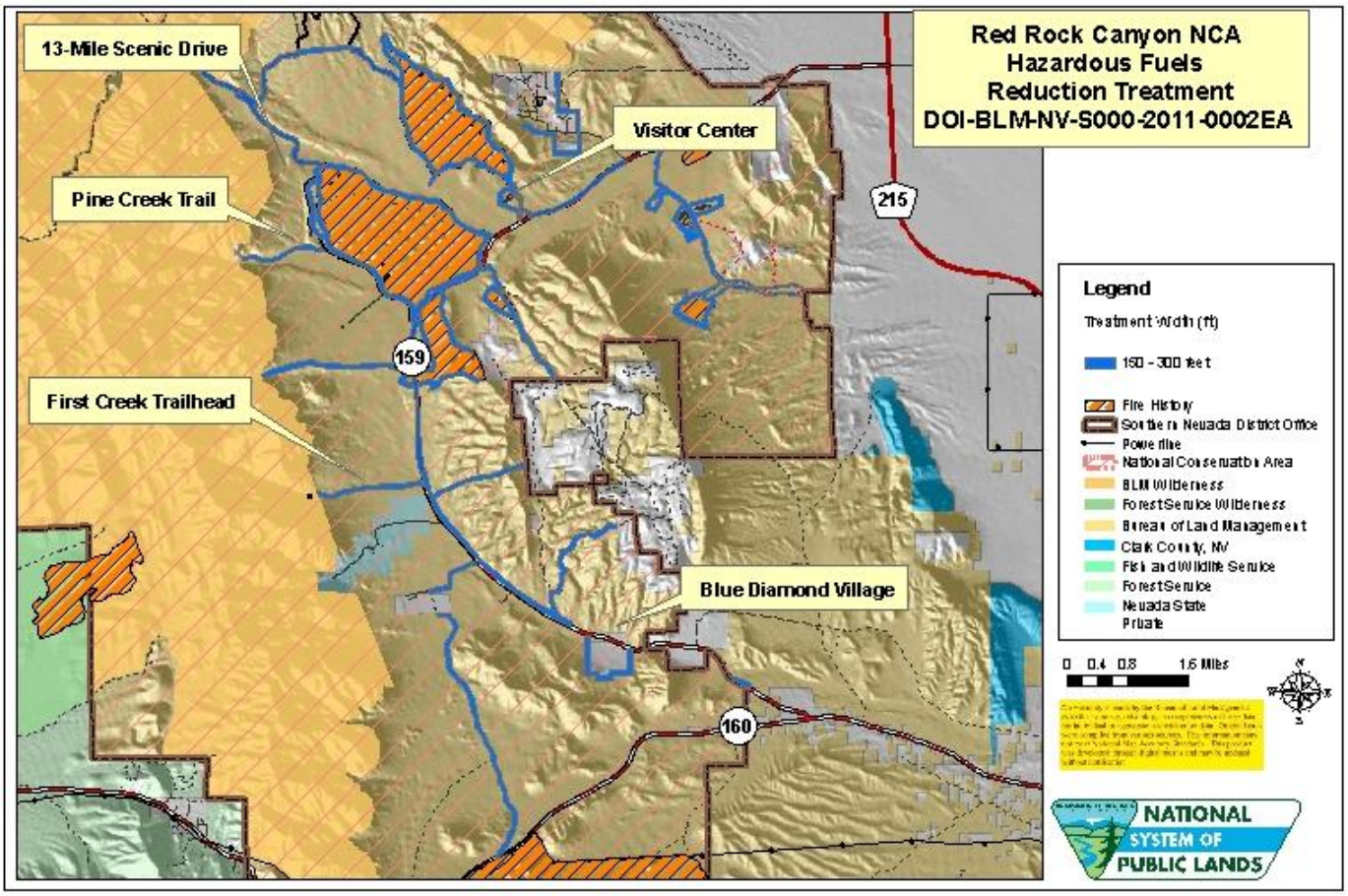
- Loop Fire with 858 acres;
- Scenic Fire with 1,611 acres;
- Bonnie Springs Fire with 389 acres;
- Diamond Fire with 119 acres; and
- Overlook Fire with 61 acres.

The total proposed area of linear fuel breaks would compose 2,114 acres along approximately 65 miles. With the 2,346 acres of burn scar in addition to the linear spray areas, a total treatment area of 4,460 acres is proposed. Application would be by a helicopter that is specially equipped for herbicide application and operated by a pilot who is qualified for herbicide application and/or backpack sprayers supported by Utility Terrain Vehicles (UTVs). A portion of the Scenic Drive could be sprayed by helicopter to reduce the amount of time that it is closed to the public. The Pine Creek parking area within the Scenic Drive would be used as the helicopter support area. This heli-base is paved and provides easy access from the Scenic Drive for fuel and water support and would serve as the base of operations where herbicide would be mixed according to label instructions and BLM Best Management Practices (BMPs), and the helicopter would be loaded, fueled, and secured when not in use. Personnel utilizing backpack sprayers supported by UTVs could treat all other areas. The use of UTVs to support personnel using backpack sprayers will be limited to roads and trails. All applicators would carry required credentials for the State of Nevada.

Treatments would occur during the fall/winter season avoiding wild horse and burro foaling season and wildlife sensitive seasonal times, such as migratory bird, bird nesting, and desert tortoise (*Gopherus agassizii*) season. These herbicides are for terrestrial use only and would not be applied directly to water or to areas where surface water is present or in washes. No application would be done during windy or gusty conditions or if it is raining or forecasted to rain within 48 hours of application. Label specifications will guide helicopter, backpack sprayer, herbicide, adjuvant and drift inhibitor usage along with Personal Protective Equipment (PPE), application rate, coverage, mixing methods, droplet size to reduce runoff and drift, and herbicide storage and disposal (see Appendix B for additional information on SOPs For Herbicide Use).

The Proposed Action herbicide treatment would create fuel breaks that would help aid in minimizing fire spread and protect infrastructure within the RRCNCA, such as: the Red Rock Canyon Visitor Center, the Red Rock Canyon Fire Station, and the Moenkopi Campground.

Infrastructure adjacent to RRCNCA, such as private residences in Blue Diamond and Calico Basin, would also benefit with the creation of these fuel breaks.



Map 2.1. Red Rock Canyon Hazardous Fuels Reduction; Herbicide Treatment

2.2. Description of Any Other Action Alternatives Analyzed in Detail:

2.2.1. Alternative B: (Mechanical Mowing)

Treatments to remove hazardous fuels would be by mowing using equipment such as: Dixie harrow, rotary mower, or other mastication equipment. The areas to be treated with Alternative B (Mechanical Mowing) would be linear strips adjacent to existing roads (i.e. Scenic Drive), hiking trails, terrain features (i.e. along outer perimeter of washes) that provide natural barriers to fire spread, RRCNCA infrastructure (i.e. Red Rock Canyon Visitor Center, the Red Rock Canyon Fire Station, and the Moenkopi Campground and Extension on Moenkopi Road) and existing fire scars (i.e. Loop Fire). Alternative B (Mechanical Mowing) treatments along roads, trails, and natural features would be 150 feet on both sides of the feature creating a 300 foot fuel break. However, all washes with potential penstemon habitat would be avoided. Alternative B (Mechanical Mowing) would occur 300 feet in from just the east side of the road along State Route 159 from just north of Blue Diamond to the intersection of State Route 160 to avoid washes

that may support penstemon. Additionally, Alternative B (Mechanical Mowing) would not occur in the north tip (T. 20S, R. 58E Sect. 34) of the Scenic Drive to avoid penstemon habitat.

Alternative B (Mechanical Mowing) treatments around infrastructure would create a 300 foot buffer around the buildings. Alternative B (Mechanical Mowing) treatments along fire scars would be 300 feet inside of the scar to hinder a fire start from inside from escaping into previously unburned areas. Approximately two-inch high vegetation stubble or litter would be left remaining in the fuel break, thus leaving the targeted brome culms intact. Brome species can re-sprout after mowing if the culm is left intact (Hulbert 1955). Thus, it is presumed that Alternative B (Mechanical Mowing), in comparison with the Proposed Action, would provide a reduced magnitude of brome population reduction post-treatment.

The area to be treated with Alternative B (Mechanical Mowing) would create 2,114 acres of linear fuel break along approximately 65 miles. Alternative B (Mechanical Mowing) locations would be in the same areas as the Proposed Action, excluding fire scar interiors (see Map 2.2). Alternative B (Mechanical Mowing) would occur during the fall/winter season, September through February, avoiding wild horse and burro foaling season and wildlife sensitive seasonal times, such as migratory bird, bird nesting, and desert tortoise season. Based on favorable weather conditions, Alternative B (Mechanical Mowing) would take approximately six months each year to complete.

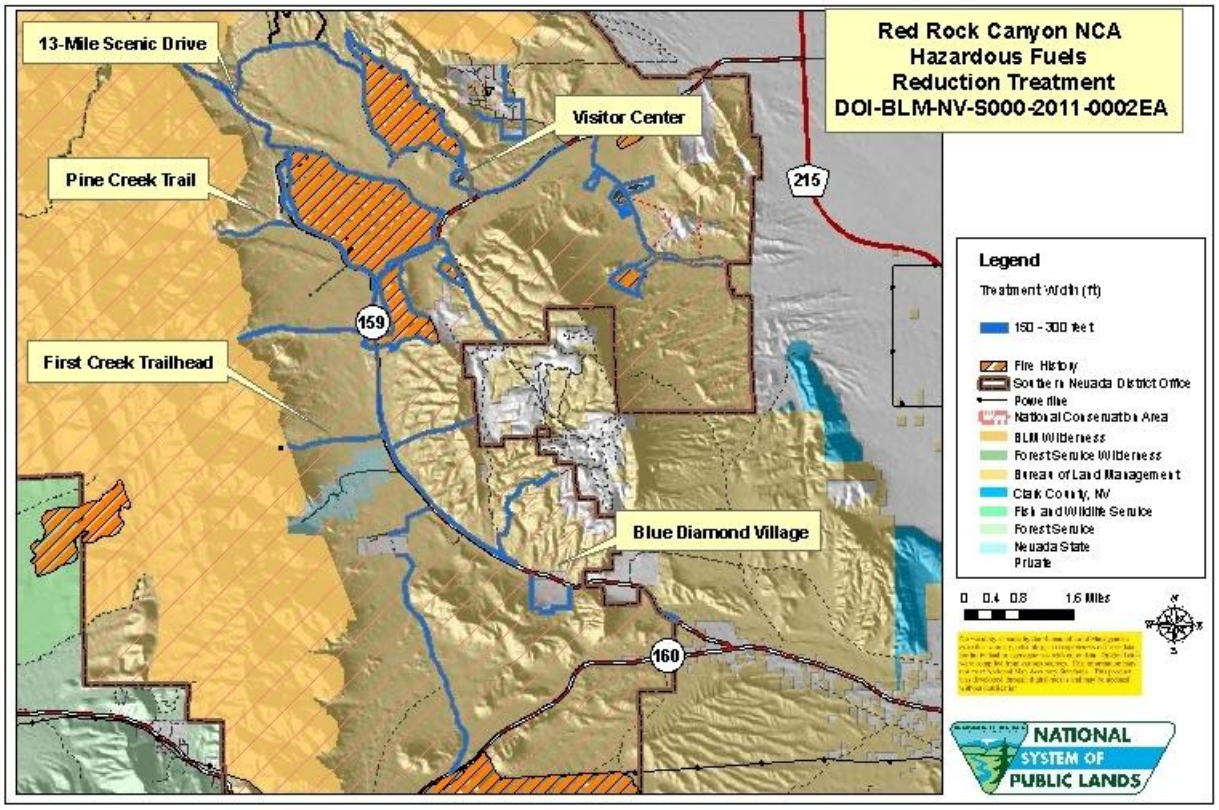
2.2.2. Alternative C: (Mechanical Blading)

Treatments to remove hazardous fuels would be by mechanical blading using equipment such as: bulldozer, bobcat or grader. The areas to be treated by Alternative C (Mechanical Blading) would be linear strips adjacent to existing roads (i.e. Scenic Drive), hiking trails, terrain features (i.e. along outer perimeter of washes) that provide natural barriers to fire spread, RRCNCA infrastructure (i.e. Red Rock Canyon Visitor Center, the Red Rock Canyon Fire Station, and the Moenkopi Campground) and existing fire scars (i.e. Loop Fire). Alternative C (Mechanical Blading) along roads, trails, and natural features would be 150 feet on each side of the feature creating a 300 foot fuel break. However, all washes with potential penstemon habitat would be avoided. Alternative C (Mechanical Blading) would occur 300 feet in from just the east side of the road along State Route 159 from just north of Blue Diamond to the intersection of State Route 160 to avoid washes that may support penstemon. Additionally, Alternative C (Mechanical Blading) would not occur in the north tip (T. 20S, R. 58E Sect. 34) of the Scenic Drive to avoid penstemon habitat.

Alternative C (Mechanical Blading) treatments around infrastructure would create a 300 foot buffer around the buildings. Alternative C (Mechanical Blading) treatments along fire scars would be 300 feet inside of the scar to hinder a fire start from inside from escaping out into previously unburned areas. Alternative C (Mechanical Blading) would create 300 foot wide fuel breaks composed solely of barren ground. The linear area to be bladed would be 2,114 acres along approximately 65 miles. Alternative C (Mechanical Blading) locations would be in the same areas as the Proposed Action, excluding fire scar interiors (see Map 2.2).

Alternative C (Mechanical Blading) would occur during the fall/winter season, September through February, avoiding wild horse and burro foaling season and wildlife sensitive seasonal times, such as migratory bird, bird nesting and desert tortoise season. Based on favorable weather conditions, Alternative C (Mechanical Blading) would take approximately six months each year to complete.

The Proposed Action, Alternatives B (Mechanical Mowing) and Alternative C (Mechanical Blading) would adhere to BMPs in Appendix D.



Map 2.2. Red Rock Canyon Hazardous Fuels Reduction; Mechanical Treatment

2.2.3. Alternative D: No Action

Under the No Action Alternative invasive annual grasses within RRCNCA would not be treated. The extent and dominance of brome species composing fine fuels would continue to increase; ultimately competing with native vegetation for resources and contributing to the potential threat of wildfire.

2.3. Alternatives Considered but not Analyzed in Detail

Alternatives to the Proposed Action that were considered but eliminated from detailed analysis included: Create a Green-strip, Graze Domestic Livestock and Graze Wild Horses and Burros.

2.3.1. Create a Green-Strip

An alternative to create a green-strip in the proposed fuel break locations by seeding non-native species such as forage Kochia (*Kochia prostrata*) and crested wheatgrass (*Agropyron cristatum*) was considered but eliminated from detailed analysis due to the non-conformance with the RRCNCA Resource Management Plan (RMP) and ROD (2005).

2.3.2. Graze Domestic Livestock

An alternative to reduce invasive annual grasses in the fuel break locations by use of domesticated cattle, sheep or goat grazing was considered but eliminated from detailed analysis due to non-conformance with the RRCNCA RMP and ROD (2005). There are no active grazing allotments within the RRCNCA.

2.3.3. Graze Wild Horses and Burros

An alternative to reduce invasive annual grasses in the fuel break locations by use of wild horse and burro grazing was considered but eliminated from detailed analysis.

The Red Rock HMA is located in southern Nevada within Clark County. The Red Rock HMA comprises nearly 161,000 acres of BLM managed public land and is bisected by State Route 160. The wild horses live primarily south of State Route 160 and the majority of the wild burros are north of State Route 160. The appropriate management level for the Red Rock HMA was established in 2004 as a population range of 29–49 wild burros and 16–27 wild horses.

2.4. Conformance

In November 1990, Congress passed the RRCNCA Establishment Act designating Red Rock Canyon as a National Conservation Area. The legislation calls for providing recreation opportunities allowing the public to enjoy and appreciate the unique natural setting which composes Red Rock Canyon, but the primary direction is to conserve and protect these natural resources. The Proposed Action is also supported by the Spring Mountains Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy, 10 Year Plan (2009).

The EA is in conformance with the RRCNCA RMP and ROD (2005), and the Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States PEIS and ROD (2007).

The Proposed Action follows the guidelines and methods approved in Final Vegetation Treatments on BLM Lands in 17 Western States, PEIS and ROD (2007). The Report outlines the methods to be used, specifies approved chemicals and allowed application rates, human health impacts, compares treatment impacts, and analyzes environmental and cumulative impacts.

The Council on Environmental Quality (CEQ) regulations at 40 CFR 1508.28, provides for tiering this EA to a broader Environmental Impact Statement (EIS). This EA tiers to the Final Vegetation Treatments on BLM Lands in 17 Western States, PEIS and ROD (2007). This EA also incorporates by reference, the environmental analysis with respect to herbicides as presented in Volume 1, Chapter 4, pages 4-1 to 4-253.

Chapter 3. Affected Environment

The Affected Environment section describes the existing conditions of the environmental resources within the project area. There are several resources that are not present in the project area or are present but would not be affected by the Proposed Action. The resources that were considered but not deemed to be potentially effected by the Proposed Action, Alternative Actions or No Action Alternative are noted in Table 1, and will not be discussed further.

The table below summarizes the environmental attributes that have been reviewed, whether they may be affected by the Proposed Action, Alternatives B or C, or No Action Alternative and the rationale for that determination. Elements with identified issues that were further analyzed in the document include: Air Quality, BLM Sensitive Plant Species, BLM Sensitive Wildlife Species, Floodplains, Fuels/Fire Management, Human Health and Safety, Hydrologic Conditions (Including Water Quality), Invasive Species/Noxious Weeds, Migratory Birds, Recreation, Socio-Economics, Soils, Threatened, Endangered or Candidate Species, Vegetation Excluding Federally Listed Species, Visual Resources, Wetlands/Riparian, Wild Horses/Burros, Wilderness, and Wildlife Excluding Federally Listed Species. Elements that would not be affected will not be discussed further in this EA.

Table 3.1. Affected Resources Table

Supplemental Authority	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale
Air Quality			X	The Project Area is currently under National Ambient Air Quality Standards compliance for criteria pollutants. Alternative B (Mechanical Mowing) and Alternative C (Mechanical Blading) would be expected to temporarily increase fugitive dust emissions. Impacts are assessed in this EA.
Areas of Critical Environmental Concern (ACEC)	X			The Proposed Project area is not within an ACEC or any critical desert tortoise habitat.
Areas with Wilderness Characteristics	X			The Proposed Project area is located in areas which do not meet the elements of wilderness characteristics.
BLM Natural Areas	X			The Proposed Project is not located within North Pine Creek Natural Area.
BLM Sensitive Plant Species			X	Impacts are assessed in this EA.
BLM Sensitive Wildlife Species			X	Impacts are assessed in this EA.
Cultural Resources		X		No expected impacts. Disturbance will be minimal surface disturbance, see Appendix D for BMPs.
Environmental Justice	X			No minority or low-income communities are present in or near the Project Area.
Farmlands (Prime/ Unique)	X			There are no prime or unique farmland designations in the District.
Fish Habitat	X			Resource is not present in the Project Area.
Floodplains			X	The project area is currently compliant with the Federal Emergency Management Agency, Nevada Division of Environmental Protection, and Clark County Regional Flood Control District regulations. Impacts are assessed in this EA.

Forests and Rangelands		X		The project is within the closed Kyle Canyon Allotment.
Fuels/Fire Management			X	Impacts are assessed in this EA.
Geology/Minerals/ Energy Production	X			Any excavation that produces mineral materials must be used within the project area or stockpiled on site for sale by the BLM. If mineral materials are to be stockpiled for sale a contract will be necessary before the stockpiled mineral materials can leave the area.
Greenhouse Gas Emissions		X		Currently there are no emission limits for suspected Greenhouse Gas (GHG) emissions, and no technically defensible methodology for predicting potential climate changes from GHG emissions. However, there are, and will continue to be, several efforts to address GHG emissions from federal activities, including BLM authorized uses.
Human Health and Safety			X	Impacts are assessed in this EA.
Hydrologic Conditions (Including Water Quality)			X	Impacts are assessed in this EA.
Invasive Species/ Noxious Weeds			X	Invasive species and legally classified noxious weeds are present in the proposed treatment areas. Impacts are assessed in this EA.
Lands/Access		X		There are multiple communication sites in the Blue Diamond Area. Ensure that helicopters follow Federal Aviation Administration protocol if entering the area, if this method is used for herbicide application. Notify any adjacent right-of-way holders in the area. BLM Communication Site tower at this location is 30'. Disturbance must be kept to a minimum to keep the smallest footprint for the project possible.
Livestock Grazing	X			There is no livestock grazing in the proposed project area.
Migratory Birds			X	Impacts are assessed in this EA.
Native American Religious Concerns		X		No Issues, disturbance will be minimal surface disturbance, see Appendix D for BMPs. Sub surface disturbance activities will be monitored for any potential archaeological resources of Native American concern. If significant cultural resources are identified during ground disturbing activities work will stop in the immediate proximity of the find, and affected tribes and the Nevada State Historic Preservation Officer will be notified.
Paleontological Resources		X		No Issues, with the reduction of fuels this project has the potential to protect significant paleontological resources from burning. Disturbance will be minimal surface disturbance, see Appendix D for BMPs. Sub surface disturbance activities will be monitored by an archeological monitor for any potential paleontological resources.
Recreation			X	Impacts are assessed in this EA.

Socio-Economics			X	Impacts are assessed in this EA.
Soils			X	Impacts are assessed in this EA.
Threatened, Endangered or Candidate Species			X	There are no Threatened, Endangered or Candidate Plant Species in the project area. The Federally Threatened desert tortoise is present and the Proposed Action required formal consultation with the USFWS and was appended to the RRCNCA Programmatic biological opinion (PBO) (File No. 1–5–04–F-526). Impacts are assessed in this EA.
Vegetation Excluding Federally Listed Species			X	The Proposed Action would alter the vegetation community structure by preventing the germination and establishment of annual and perennial grasses, and annual plants in the treatment areas. Accumulated rainfall along the edges of roadsides and trails often creates abundant displays of wildflowers. These displays would no longer occur in treatment areas. Impacts are assessed in this EA.
Visual Resources			X	Impacts are assessed in this EA.
Wastes Hazardous or Solid	X			Resource is not present in the Project Area.
Water Quality Drinking/Ground			X	Impacts are assessed in this EA under Hydrologic Conditions (Including Water Quality).
Wetland/Riparian			X	The greatest threat to wetland/riparian zones in the Project Area stems from wildfires, which are more likely under the No Action Alternative. Wildfires have the potential to completely denude these sensitive areas. Impacts are assessed in this EA.
Wild and Scenic Rivers	X			Resource is not present in the Project Area.
Wild Horses/Burros			X	The Proposed Project is located in the Red Rock HMA. The 2011 estimated adult population is 29–44 wild burros and 48–58 wild horses. Impacts are assessed in this EA.
Wilderness			X	Impacts are assessed in this EA.
Wildlife Excluding Federally Listed Species			X	Impacts are assessed in this EA.
Woodland/Forestry			X	Cactus and yucca are regulated under the BLM Nevada forestry program. Impacts are assessed in this EA under Vegetation Excluding Federally Listed Species.

3.1. Air Quality

Air quality is determined by several factors, including natural processes, like dust storms, wildfires and human activity. Scientific methods of studying air quality are used to determine levels of air pollution and measure concentrations of specific pollutants that may be in the air as compared to standard measurements set specifically for those air pollutants. The USEPA sets the standards and establishes regulations for the federal government.

The Proposed Project area is located within the Red Rock NCA (LE), NV-050-06 Fire Management Unit (FMU). Under the Clean Air Act ([CAA] as amended 1990), the project area

was declared a Class II air quality classification by the state of Nevada, which allows moderate deterioration associated with moderate, well controlled industrial and population growth. BLM will manage all public lands within this FMU as Class II unless the distinctions are reclassified by the state as a result of the procedures as prescribed in the CAA.

Existing sources of air pollution in the project area include wind blown dust and vehicle emissions from visitors, which may temporarily increase and/or decrease depending on the season.

Another source of air pollution is the smoke from man-made or naturally occurring wildfires. Fires classified as high severity have the potential to consume half to all of the available fuels. High severity fires leave behind white or gray ash which offers little protection from rainfall and erosion.

Following fire if suitable conditions are present such as soil type, fire intensity, and vegetation a water repellent layer may form on top of the soil. The water repellent layer acts as a barrier to water infiltration during rain events and contributes to increased runoff and soil erosion.

Soil erosion has long term impacts to resources, especially air quality. The loss of soil not only contributes to fugitive dust but it deprives land of its soil. The loss of soil affects the ability for vegetation to reestablish and stabilize disturbed areas.

3.2. BLM Sensitive Plant Species

BLM Sensitive Plant Species are species that require special management consideration to avoid potential future listing under ESA and that have been identified in accordance with procedures set forth in BLM Manual 6840. The following sensitive plant species are known to potentially occur within the Proposed Project area: Yellow two-tone beardtongue and the Blue Diamond cholla.

Yellow Two-tone Beardtongue (*Penstemon bicolor ssp. bicolor*)

Habitat Requirements and Natural History: The yellow two-tone beardtongue is a BLM special status species restricted to western Clark County, Nevada including the Las Vegas Valley, RRCNCA and the McCullough Mountains (Glenne 2003). The yellow two-tone beardtongue, and the closely related rosy two-tone beardtongue (*Penstemon bicolor ssp. roseus*), are short lived perennial herbs that reproduce from seed. All known sites are surrounded by Sonora-Mojave Creosotebush-White Bursage Desert Scrub and Mojave Mid-Elevation Mixed Desert Scrub. Both sub species are generally restricted to naturally and artificially disturbed, often calcareous, moisture accumulating sites such as washes, roadsides, rocky slopes, crevices and talus between 1800 and 5480 feet elevation (Smith 2005). The historic distribution of the yellow two-tone beardtongue includes 43 recorded occurrences (Glenne 2003). Since 2003, 11 of the recorded occurrences within the BLM Las Vegas Valley disposal boundary have been developed. Presently, the known distribution includes 32 recorded occurrences.

Blue Diamond Cholla (*Cylindropuntia whipplei var. multigeniculata*)

Habitat Requirements and Natural History: The Blue Diamond cholla is a BLM special status plant species endemic to Clark County, Nevada. The Blue Diamond cholla is a cactus restricted to dry gypsiferous limestone areas mostly on cooler or more protected exposures (ledges of canyon walls, north sloping surfaces), and more rarely on exposed ridges from 3450 to 4350 feet elevation. All plant populations occur within Sonora-Mojave Creosote bush-White Bursage Desert Scrub and Mojave Mid-Elevation Mixed Desert Scrub communities. Presently, there are

four known population complexes (Baker 2005); including: Gass Peak in the Las Vegas Range, La Madre Mountain and Blue Diamond Hill in RRCNCA and in the McCullough Mountains of Sloan Canyon National Conservation Area (NCA) (Baker 2005).

3.3. BLM Sensitive Wildlife Species

BLM Sensitive Wildlife Species are species that require special management consideration to avoid potential future listing under ESA and that have been identified in accordance with procedures set forth in BLM Manual 6840. BLM Sensitive Wildlife Species that may occur within RRCNCA:

Mammals

There is one sensitive mammal species that occurs within the project area.

Desert Bighorn Sheep (*Ovis canadensis*)

Habitat Requirements and Natural History: Desert bighorn sheep are a species of management concern that occur mainly along desert mountain ranges in Nevada and California to west Texas and south into Mexico. Desert bighorn sheep are gregarious, sometimes forming herds of more than 100 individuals, but small groups of 8-10 are more common. They usually migrate seasonally, using larger upland areas in the summer and concentrating in sheltered valleys during the winter.

Bats

There are several sensitive species of bat that occur within the project area including:

- California myotis (*Myotis californicus*)
- Brazilian free-tailed bat (*Tadarida brasiliensis*)
- Western red bat (*Lasiurus borealis*)
- Big brown bat (*Eptesicus fuscus*)
- Western small-footed bat (*Myotis ciliolabrum*)
- Townsend's big-eared bat (*Plecotus townsendii pallescens*)
- Cave myotis (*Myotis velifer*)
- Fringed myotis (*Myotis thysanodes*)
- Allen's big-eared bat (*Idionycteris phyllotis*)
- Western pipistrelle (*Pipistrellus hesperus*)
- Pallid bat (*Antrozous pallidus*)
- Long-legged myotis (*Myotis volans*)
- Hoary bat (*Lasiurus cinereus*)

Habitat Requirements and Natural History: Several species of bats are known to occur throughout the RRCNCA. These bats' habitat ranges from low desert scrub to high elevation coniferous forests. These species utilize mines, caves, trees and buildings for day and night roost sites and are very sensitive to roost disturbance. Bats require certain minimum surface-areas of water to be able to skim their drinking intake while in full flight.

Reptiles

There are several sensitive species of reptiles that occur within the project area including desert glossy snake (*Arizona elegans eburnata*), Mojave desert sidewinder (*Crotalus cerastes*), Mojave shovel-nosed snake (*Chionactis occipitalis occipitalis*), banded Gila monster, and western chuckwalla (*Sauromalus obesus*).

Desert Glossy Snake (*Arizona elegans eburnata*)

Habitat Requirements and Natural History: The desert glossy snake is a burrowing, nocturnal snake that occurs from southern Nevada, northwest Arizona and extreme southwest Utah south through eastern California. This nocturnal snake is found in a variety of habitats throughout the Mojave Desert including light shrubby to barren desert, grasslands and woodlands. The desert glossy snake generally prefers open areas with sandy to loamy soils.

Mojave Desert Sidewinder (*Crotalus cerastes*)

Habitat Requirements and Natural History: The Mojave desert sidewinder range extends from south-central California through Nevada to extreme southwestern Utah and south to extreme west-central Arizona. The Mojave desert sidewinder is primarily nocturnal and crepuscular during periods of excessive daytime heat, but may be active during daylight when the temperatures are more moderate. These snakes are not active during cooler periods in winter. This species may conceal itself by coiling up in animal burrows or in shallow self-made pits at the base of a shrub. Mojave desert sidewinders prefer sand hummocks topped with creosote, mesquite or other desert plants, flats, barren dunes, hardpan and rocky hillsides.

Mojave Shovel-nosed Snake (*Chionactis occipitalis occipitalis*)

Habitat Requirements and Natural History: The Mojave shovel-nosed snake range extends from California deserts and east to the state line into southern Nevada and west central Arizona. This burrowing, nocturnal snake frequents washes, dunes, sandy flats, loose soil, and rocky hillsides in sandy gullies or pockets among the rocks throughout the Mojave Desert.

Banded Gila Monster (*Heloderma suspectum cinctum*)

Habitat Requirements and Natural History: The banded Gila monster is a large, heavy-bodied lizard with a massive head, a short thick tail, and short limbs with strong claws. The banded Gila monster's range includes extreme southwestern Utah, southern Nevada, and adjacent southeastern California south through southern Arizona, southwestern New Mexico, and much of Sonora to Sinaloa, Mexico. Its habitat includes Mojave and Sonoran desert scrub, desert grassland, thorn scrub, and occasionally pine-oak woodland.

Western Chuckwalla (*Sauromalus obesus*)

Habitat Requirements and Natural History: The western chuckwalla is a Nevada State Protected Species that is found throughout the deserts of the southwestern United States and northern

Mexico. Western chuckwalla inhabit rocky outcrops where cover is available between boulders or in rock crevices, typically on slopes and open flats below 5,000 feet (1,524 meters). Typical habitat includes rocky hillsides and talus slopes, boulder piles, lava bed, or other clusters of rock, usually in association with Mojave Desert scrub vegetation. This species requires shady, well-drained soils for nests. The western chuckwalla is a widespread species, but is regionally limited by its requirement for rock outcrops.

Birds

There are several sensitive species of birds that occur within the project area. These species include golden eagles (*Aquila chrysaetos*), peregrine falcons (*Falco peregrinus*), western burrowing owl (*Athene cunicularia*) and loggerhead shrikes (*Lanius ludovicianus*).

Golden Eagle (*Aquila chrysaetos*)

Habitat Requirements and Natural History: The golden eagle is a large, broad-winged bird of prey with dark brown plumage and a distinct white band on the tail. A migratory bird, this species occurs throughout most of North America. Golden eagle can be found in open country, open wooded country, and barren areas, especially in hilly or mountainous regions from sea level to 11,500 feet (3,505 meters) and prefers open mountainous country with cliffs and large trees.

Golden eagle breeding season occurs from late January to August; and peaks in March to July. In North America, it breeds from northern and western Alaska east to the Northwest Territories, Canada, and south to Baja California. This raptor nests on cliffs, in large trees in open areas, and occasionally in wetland, riparian and estuarine habitats. The golden eagle requires open terrain for hunting such as grasslands, deserts, savannahs and early successional stages of forest and shrub habitats.

Peregrine Falcon (*Falco peregrinus*)

Habitat Requirements and Natural History: The American peregrine falcon belongs to the genus "Falco," which is characterized by long-pointed wings. The peregrine falcon occurs throughout much of North America, from the sub arctic boreal forests of Alaska and Canada south to Mexico. This is a species adapted to open habitats in all seasons. Peregrines feed primarily on birds; however, they also hunt mammals (primarily bats and rodents), and on rare occasions, amphibians, fish and insects (Comrack and Logsdon 2008).

Breeding season occurs from March to August. Peregrines usually nest on high, remote cliff ledges. Essential breeding habitat for the falcon includes cliffs and bluffs with high ledges that contain loose substrate for scraping (Comrack and Logsdon 2008).

Loggerhead Shrike (*Lanius ludovicianus*)

Habitat Requirements and Natural History: Loggerhead shrikes are large-headed, grey, black and white birds with a distinct hooked bill. A migratory bird, loggerhead shrikes occur across North America. This species occurs in woodlands, savannah, pinyon-juniper, Joshua tree, riparian woodlands, desert oases, scrub and washes.

The loggerhead shrike prefers open country with a nesting habitat preference toward scattered trees and shrubs. They are commonly found in shrub habitat types comprising savannah, desert scrub and occasionally, open woodland.

Loggerhead shrikes breed in pastures, shrublands, open woodlands and riparian areas from January to July. This species foraging behavior consists of perching on the top of fences and shrubs and scanning for prey primarily on the ground but occasionally in flight. This species requires tall shrubs or trees for perching during hunting, and nest placement. If natural perches are unavailable they will perch on poles, wires or fence posts.

Western Burrowing Owl (*Athene cunicularia*)

Habitat Requirements and Natural History: The western burrowing owl is a diurnal bird of prey specialized for grassland and shrub steppe habitats in western North America. The owls are widely distributed throughout the Americas and can be found from central Alberta, Canada to Tierra del Fuego in South America. This species occurs in grasslands, deserts and scrublands with low growing vegetation and in altered landscapes such as agricultural lands and golf courses at elevations up to 5,300 feet (1,600 meters). Western burrowing owls prefer open habitats with short vegetation and few shrubs with established small mammal burrows or areas with soft sandy soils for digging burrows for roosting and nesting. Western burrowing owls most frequently use mammal burrows created by other animals such as ground squirrels (*Spermophilus* spp.), coyotes (*Canis latrans*) and/or desert tortoises. The burrows are used for nesting, roosting, cover and caching prey.

The western burrowing owl breeds from March to August but may begin as early as February and extend into December. This species typically forages on the ground or from a perch within 1,970 feet (600 meters) of its burrow but has been recorded foraging up to 1.5 miles away from its burrow.

Invertebrates

Springsnails (*Prygulopsis deaconii*) and (*Prygulopsis turbatrix*)

Habitat Requirements and Natural History: Freshwater springsnails are endemic to Red Springs, Willow Spring, Lost Creek and La Madre Spring.

3.4. Floodplains

A specific approach to understanding and assessing flood hazards on alluvial fans has been developed for arid alluvial fans in southern Nevada. This approach uses geologic mapping to determine active and inactive portions of alluvial fans. Physical features such as stratigraphic relationships, topography, drainage patterns, soil development, and surface morphology are used to determine active and inactive portions of fans. Certain portions of alluvial fans can become inactive and may remain inactive for thousands of years. Wildfire is likely to alter the accuracy of surface water modeling on alluvial fans and increase the associated flood hazards.

3.5. Fuels/Fire Management

There have been multiple fires that have burned in RRCNCA both human and naturally caused. Through past wildfires in the RRCNCA [(Loop, Diamond and Overlook (2005), Scenic (2006) and Bonnie Springs (2007)] the fire regime has been altered to an unnatural “annual grass/fire cycle.”

The project is located within the RRCNCA (Low Elevation) (NV-050-06), FMU. About 2.8% or 4,166 acres in the FMU is within Fire Regime I, 51.5% or 76,922 acres is in Fire Regime II,

6.5% or 9,690 acres is in Fire Regime IV, and 39.2% or 58,510 acres are in Fire Regime V (USDI BLM 2004). A natural fire regime is a general classification of the role fire would play across a landscape in absence of modern human mechanical intervention. Fire regimes are classified based on the average number of years between fires (fire frequency) combined with severity (amount of replacement) of the fire on dominant vegetation (Appendix E Fire Regime table). The Mojave Desert is generally considered to not be fire adapted.

Red brome and cheatgrass invasion alters fire frequency from historic regime intervals to shorter cycles of 5 years or less. Historic fires have converted areas within the FMU to red brome and cheatgrass dominated sites.

A fire regime conditions class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). This classification is based on a relative measure describing the degree of departure for the natural (historical) fire regimes. FRCC 3 is a high departure from the central tendency of the natural regime, primarily due to the effects from wildfire. Over 13% of the acres in the RRCNCA (Low Elevation) FMU are in FRCC 3. Past fire history reflects alteration for the majority of acres within the FMU from natural regimes to regimes with a high departure from the natural regime indicated by the amount of FRCC 3 acres. Frequency intervals and severity should increase over time and will be influenced by areas dominated by red brome and cheatgrass.

3.6. Human Health and Safety

BLM approved herbicides were evaluated in the 2007 Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States PEIS and ROD (USDI BLM 2007a). The evaluation included effects to human health and safety. Two herbicides analyzed and proposed for use in the Proposed Action are Imazapic and Glyphosate.

Imazapic (Plateau®) is a USEPA approved herbicide (Reg. No. 241–365) and is approved by BLM for use on public lands. The Final Vegetation Treatments using Herbicides on BLM lands in 17 Western States PEIS and ROD (2007) identified two possible receptors to exposure to herbicides; occupational and public receptors. Occupational receptors include workers who mix, load, and apply herbicides. Public receptors would include the public likely to come into contact with herbicides such as ranchers, hunters, and other public land users. According to the MSDS (BASF 2010a), Plateau® does not cause cancer, is unlikely to cause birth defects, and did not interfere with reproduction based on laboratory animal studies.

Journey® (a combination of Imazapic and Glyphosate) is a USEPA approved herbicide (Reg. No. 241–417) and is approved by BLM for use on public lands. According to the MSDS (BASF 2010b), Journey® does not cause cancer, is unlikely to cause birth defects, and did not interfere with reproduction based on laboratory animal studies.

3.7. Hydrologic Conditions (Including Water Quality)

Desert washes, which are the typical in the Mojave Desert region including those in RRCNCA, are braided in plain view. These streams flow only intermittently during seasonal precipitation events, are unstable, and can migrate laterally during significant runoff. Water in this area commonly flows into dry lakes, or as in the case of RRCNCA, detention basins.

Geologically, the Proposed Project area is located on alluvial fan lobes that form large, cone-shaped, sedimentary deposits. It is likely that most of Proposed Project area is on alluvial fan that have originated from significant amounts of flowing water carrying, and subsequently depositing, sediments across their entire extent during their life span. Dry washes can also carry destructive bedloads (boulders and gravels) during rain events.

The hydrologic processes that occur on alluvial fans can be random and difficult to model. Sediments, which can range from clay to large boulders, are transported across alluvial fans by water in desert washes, debris flows, and sheet floods. Flood events on alluvial fans in arid climates are triggered by significant storms. Specific to the Mojave Desert region, these would include the random summer cloud bursts that occur infrequently but can supply a large amount of water to a localized area, or a larger storm such as a tropical storm that occurs on a 100-year time scale. Any of these storms could result in flooding hazards that would cause significant damage across the Proposed Project area and could potentially cause significant localized destruction, especially following a vegetation consuming wildfire.

3.8. Invasive Species/Noxious Weeds

Several laws authorize control of noxious weeds on public land under the BLM's administrative jurisdiction including: the Federal Insecticide, Fungicide and Rodenticide Act of 1910 (as amended in 1972, 1988 and 1996), the Federal Noxious Weed Act of 1975, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. Additionally, Executive Order 13112 outlines the federal responsibility to "prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause..."

Nevada Revised Statutes, Chapter 555.05 defines "noxious weeds" and mandates the extent that land owners and land management agencies must control specific noxious weed species on lands under their jurisdiction.

The entire project area has not been inventoried for the presence of invasive, non-native species. However, of the 47 species designated as noxious by the State of Nevada (see Appendix C), five species have been documented within RRCNCA. Noxious weed species found in RRCNCA include: malta starthistle (*Centaurea solstitialis*), giant reed (*Arundo donax*), saltcedar (*Tamarix ramosissima*), Sahara mustard (*Brassica tournefortii*) and puncturevine (*Tribulus terrestris*). Malta starthistle and giant reed are classified Category A, indicating the occurrence of these species is limited throughout the state, thus all infestations must be actively controlled with the goal of eradication. Sahara mustard is classified Category B and must be eradicated where the action is deemed feasible. It is recognized that for Category B species, some infestations may be too extensive to be realistically controlled or eradicated. Saltcedar and puncturevine are Category C, indicating the species are present to such an extent that precludes active eradication in an environmental setting for many infestations. For species classified Category C, control is required primarily by nursery plant dealers.

There are also species in RRCNCA that are non-native and invasive, yet have not been legally designated as noxious by the State of Nevada. In addition to the brome species which are the target of the Proposed Action, populations of tumblemustard (*Sisymbrium irio*), crossflower (*Chorispora tenella*), African mustard (*Malcolmia africana*), curveseed butterwort (*Ranunculus testiculatus*), common dandelion (*Taraxacum officionale*), Jersey cudweed (*Gnaphalium luteoalbum*), and Russian thistle (*Salsola* spp.) have been documented along the project route.

Previous herbicide application has been limited because chemical treatments are not authorized for desert tortoise habitat. There have been two approved herbicide treatment efforts within RRCNCA. In 2008, approval was granted to establish and treat five, 14x14 meter plots within the RRCNCA Loop Fire. The project goal was to examine the effectiveness of four herbicide treatments: Plateau®, Glyphosate (trade name RoundupPro®), a mixture of Glyphosate (trade name Rodeo®) and Plateau®, and Sulfometuron methyl (trade name OustXP®) for treating post-fire brome infestations, ultimately improving native vegetation and the threatened desert tortoise habitat. Additionally, in Spring 2011 an approved project to apply Journey® within the fenced RRCNCA Fire Station was implemented. The treatment targeted brome species, Russian thistle, Malta starthistle and general thistle species within the compound.

3.9. Migratory Birds

Under the Migratory Bird Treaty Act of 1918 and subsequent amendments (16 U.S.C. 703-711), it is unlawful to take, kill, or possess migratory birds. A list of the protected bird species can be found in 50 C.F.R. §10.13. The list of birds protected under this regulation is extensive and the project site has potential to support many of these species, including the BLM Sensitive Species western burrowing owl. Avian species tend to be most sensitive to disturbance during the breeding season, generally between March 15 and July 30.

3.10. Recreation

The primary area for recreational use within RRCNCA includes a system of trails and roads including the Scenic Drive, Red Spring, Calico Basin area, facilities along State Route 159 including the Dedication Overlook, Scenic Drive Exit, Old Oak Creek, First Creek, and Moenkopi Road. The Scenic Drive averages approximately 900,000 visitors per year.

There are 19 existing trails designated in the Proposed Project area of RRCNCA. Pit toilets are located in the Red Spring area, at eight locations along the Scenic Drive and 10 in the picnic area. RRCNCA parking is mainly provided for sightseeing, hiking and climbing. Developed parking for equestrian use is provided at the exit of the Scenic Drive and at White Rock Spring Road. Off-road access is available along the Rocky Gap Road, a seven-mile section of non-maintained road which bisects the Rainbow Mountain and La Madre Wilderness.

RRCNCA has a high concentration of year-round and seasonal springs. Primary uses of RRCNCA are hiking, mountain climbing, picnicking, road biking, photography, sightseeing, special events, wildlife and cultural viewing, and weddings. The Scenic Drive receives 90% of the visitation of RRCNCA with the highest usage in the spring and fall.

The Moenkopi Campground facilitates seven group sites, five recreation vehicle (RV) sites, fourteen walk-in sites and 52 car-camping sites. There are two sets of camp hosts residing in the campground full-time. During the busy season (fall and spring) the campground frequently fills every night. The majority of campers stay in tents and visit RRCNCA to enjoy rock climbing, mountain biking and hiking opportunities. There has been a small increase in RV-type campers utilizing the area. A great percentage of visitors staying in RVs are Las Vegas residents seeking lower cost, nearby recreational experiences.

The Cottonwood Valley Trails System contains approximately 60 miles of trails that are designated for hiking, mountain biking, and equestrian use. There is some rock climbing in the

area particularly in the Black Velvet Canyon area. The trail system is located in the southern portion of RRCNCA and runs north and south of State Route 160. There are three designated trailheads and two main designated roads located within the trail system.

There are approximately ten miles of designated road available for off-highway vehicle (OHV) use in the Cottonwood Valley area. The Cottonwood Valley/ Late Night area is popular for permitted commercial rock climbing and mountain biking, in addition to running and mountain bike events. Fall and spring are the highest use periods for the Cottonwood Valley/Late Night area by permittees and casual users. It is also one of the few areas in RRCNCA where OHV vehicle traffic is permitted. Motorcycling, all-terrain vehicles (ATV) and UTVs are permitted on designated routes.

3.11. Socio-Economics

Social/Demographic Environment

Clark County

The RRCNCA is situated on the western edge of Clark County located in the southeast corner of the state of Nevada. Clark County, the most populous of Nevada's 17 counties, is comprised of approximately 1,968,831 residents [Nevada State Demographer (NSD) 2011], representing over 72% of the state's total population (U.S. Census Bureau 2011). Clark County's population grew by over 41% between 2000 and 2010 (U.S. Census Bureau 2010a) and state forecasting models project the population to reach 2,430,896 residents by 2030, an average 1.1% annual increase (NSD 2011).

Cities in Clark County include Las Vegas, North Las Vegas, Henderson, Boulder City, and Mesquite. The City of Las Vegas, a year-round resort destination for entertainment and recreation, is Clark County's principal population center, and was one of the fastest-growing areas in the U.S. between the 1980s and 2000s. On a larger region, the Las Vegas Valley metropolitan area comprises incorporated cities and unincorporated towns within the valley. Not only does it contain over 95% of the entire population in Clark County (Clark County Comprehensive Planning Department 2010), but it accounts for over 72% of Nevada's 2010 population and over 81% of the state's growth (U.S. Census Bureau 2011). The Las Vegas Valley metropolitan area includes: the cities of Henderson, Las Vegas and North Las Vegas; and unincorporated areas such as: Blue Diamond, Enterprise, Lone Mountain, Nellis Air Force Base, Paradise, Spring Valley, Summerlin South, Sunrise Manor and Winchester.

The community of Calico Basin is located on the eastern edge of the RRCNCA (north of State Route 159) and is within the closest proximity to the Proposed Action. Calico Basin has approximately 60 parcels with an estimated population of 75 to 100 (Rogers 2008). Other nearby communities includes Blue Diamond with a population of 290, and Summerlin South with a population 24,085. Another small community located west of the RRCNCA within the nearby SMNRA of the Toiyabe National Forest is the Mount Charleston community with a population of 357 (U.S. Census Bureau 2011).

Nye County

Located to the west of RRCNCA is Nye County. As with Clark County and the City of Las Vegas, Nye County has grown rapidly from 32,512 persons in 2000 (U.S. Census Bureau 2010b) to 45,549 persons in 2010, growing by more than 40% (Nevada State Demographer (NSD) 2011).

Population projections by the NSD forecast Nye County's growth to be 55,432 by 2030, a slow average 1.0% annual increase (NSD 2011). The Town of Pahrump is Nye County's principle population area and has experienced large increases in its population over recent decades. In 2000, the population of Pahrump was estimated at 24,181, or approximately 74% of the total population of Nye County (NSD 2010). By July 2009, the population of Pahrump had grown by 58% to approximately 38,247, more than 83% of the total population in Nye County (NSD 2010).

Economic Environment

Employment/Income

The largest employment sectors in both Clark and Nye counties are arts, entertainment, recreation and food services, employing approximately 28% in Clark County and 18% in Nye County (Nevada Department of Employment, Training, and Rehabilitation, 2011). Additionally, improved transportation corridors providing accessibility to Clark and Nye Counties have enhanced the economies by bringing visitors into the region who seek entertainment and recreation opportunities. Las Vegas tourism reached approximately 37 million visitors in 2010, and 23 million in 2011 (Las Vegas Convention and Visitors Authority 2010 and LVCVA 2011).

RRCNCA, in southern Nevada, is a destination for outdoor recreation. Red Rock Canyon was designated as Nevada's first NCA in 1990, conserving 195,819 acres of public lands. Located 17 miles west of the Las Vegas, the unique geologic features, plants and animals of RRCNCA represent some of the best examples of the Mojave Desert. RRCNCA is enjoyed by the local population as well as visitors from the United States and many foreign countries, with over one million visitors each year enjoying the spectacular desert landscape, climbing and hiking opportunities, and interpretive programs sponsored by the BLM. Visitors are drawn to RRCNCA primarily for outdoor recreational use.

While Clark County Parks and Recreation Department provides over 1,600 acres of parks and open play space in southern Nevada (Clark County Parks and Recreation 2011), RRCNCA provides a wide variety of nature-based outdoor recreation opportunities in open space natural areas in the Mojave Desert. Nature-based recreation is defined as outdoor activities in natural settings or otherwise involving in some direct way elements of nature—terrain, plants, wildlife, and water bodies (Cordell 2008). And with RRCNCA's close proximity to the Las Vegas Valley metropolitan area and surrounding communities in southern Nevada, urban residents as well as visitors to this southwest destination may experience the personal, social, environmental, and economic benefits from participating in the various nature-based outdoor recreation activities at RRCNCA.

Outdoor Recreation Economy

Statistics from a 2009 American Time Use Survey show that of the 5 hours of leisure time spent on an average day by Americans over 15 years of age, approximately 19 minutes, or 6% of time is spent participating in sports, exercise or recreation, with the remaining 94% of the time spent on more sedentary forms of leisure (U.S. Bureau of Labor 2009). While this number is low, recreation is an integral component to these daily leisure activities. Findings from a 2008 national survey by H. Ken Cordell, research scientist for the USDA Forest Service, show the number of people participating in outdoor recreation grew by 4.4 percent from 2000 to 2007, or from about 208 million to 217 million people. This study also found the number of days of participation summed across all participants and activities increased from 67 billion to 84 billion, nearly 25% (Cordell 2008).

Another study conducted in 2006 by the OIF indicates that more than three out of every four Americans participate annually in active outdoor recreation activities, such as bicycling, camping, climbing, hiking, hunting, trail-running, and wildlife viewing.

Americans who recreate spend money, create jobs, and support local communities. In 2006, the outdoor recreation economy not only contributed more than $703 billion annually to the U.S. economy, supported more than 6 million jobs across the U.S., it also generated $88 billion in annual state and national tax revenue (OIF 2006). Findings from this study have been cited by the Statewide Comprehensive Outdoor Recreation Plan of many state governments, including Alaska, Arizona, California, and New Mexico.

Outdoor recreation plays a large role in Nevada's economy. Based on the 2006 OIF study, active outdoor recreation supported 20,000 jobs across Nevada, generated $116 million in annual state tax revenue and produced $1.8 billion in annual retail sales and services across Nevada.

Revenues Generated by BLM Lands

The BLM allows land use for authorized private commercial activities, such as recreation on public land. Income generated by public land is used to assist state and local governments, support the General Fund of the U.S. Treasury, and offset charges for program operations where certain fees collected can be retained by the BLM. The USDI BLM reported that during fiscal year (FY) 2005, revenues generated from public lands in Nevada included $2.14 million in recreation fees (USDI BLM 2006b).

Fees are charged at many public recreation sites to provide for maintenance and improvement, and include access fees for Entrance Permits, Special Area Permits, Daily Use Permits, Commercial, Competitive, and Group Permits, and Leases. At other locations, generally those without public facilities, no fees are charged. In FY 2005, nearly 79% of recreational use on public lands in the U.S. in terms of visitor days, occurred in non-fee areas (USDI BLM 2006b). The BLM also issues Special Recreation Permits (SRP) to qualified commercial companies and organized groups such as outfitters, guides, vendors, and commercial competitive event organizers who conduct activities on both fee and non-fee lands. Over $2.14 million were collected in recreation fees in Nevada in 2005 (USDI BLM 2006b).

The BLM estimated the benefits to local economies from recreation on public lands. These estimates serve as one example of the economic activity that depends on the public land base. Recreational activity provides revenue for local economies through expenditures associated with activities such as fishing, hunting and wildlife viewing. In FY 2010, an estimated $763 million was injected into Nevada local economies through these recreation-associated expenditures, with hunting expenditures accounting for $101 million and wildlife viewing accounting for over $633 million (USDI BLM 2010a). These activities produce indirect financial benefits to community businesses providing food, lodging, equipment sales, transportation, and other services. State fish and wildlife management agencies also benefit from spending associated with these activities from sources such as state tax revenue and state administered fishing and hunting license programs.

Expenditures by the BLM

The budget for the BLM was $1.13 billion in FY 2010, and is projected to be $1.12 billion in FY 2012 (USDI BLM 2012). In FY 2010, $959.5 million was allocated to management of lands and resources, with the President's Budget projected to be $933.7 million in 2012 (USDI BLM 2012). These expenditures included integrated management of public land, renewable and

cultural resources, fish and wildlife, threatened and endangered species, recreation and energy and minerals.

Wildland Fire Management

While the amount budgeted for wildland fire management may be relatively consistent from year to year, the cost for fighting fires has varied substantially. The USDI allocated $ 794.8 million to wildland fire management for FY 2010 for all USDI fire efforts, with the allocation budget projected to be $729.5 million for 2012 (USDI BLM 2012).

The BLM's fire suppression expenditures for recent years has been variable, with results due to changing weather, terrain, vegetation, and proximity to populated areas all contributing to the cost of fighting a fire.

The cost of fire suppression also depends on the number and size of fires. Approximately 95% of wildland fires are controlled in the initial attack, when they are relatively small and not yet seriously out of control. Between 1999 and 2005, over 23 million acres were lost to large fires (greater than 10,000 acres) (USDI BLM 2007b).

Hazardous Fuels Reduction

Reducing the hazardous fuels available to sustain a wildland fire can be costly. The USDI treated 542,568 acres in the Wildland/Urban Interface (WUI) during 2005 at an average cost of $244 per acre. Treatment can cost up to $5,000 per acre for labor-intensive, small, mechanical treatments in forested WUI areas. During the same year, the USDI treated 726,835 acres in non-WUI areas at a cost of about $104 per acre (USDI BLM 2006a).

Herbicides and other fuel reduction management methods are employed to control invasive plant species, which have caused a variety of problems on public lands. As Duncan et al. (2004) noted, "Few comprehensive studies have assessed the magnitude of economic and environmental losses from invasive plants on range, pasture, and wildlands." This is generally due to the lack of quantitative information on ecosystem impacts and the challenge of assessing non-market cost such as those to society and the environment (e.g. changes in fire frequency, wildlife habitat, and loss of biodiversity)." (USDI BLM 2007a).

Expenditures for herbicides used on BLM land are a relatively small part of the agency's budget, accounting for only a little more than $2.7 million in FY 2005. The BLM estimated it spent $9.6 million to treat approximately 205,000 acres ($47 per acre) to treat invasive weeds throughout the U.S. during FY 2005. These costs included herbicide, labor, and equipment costs. The cost of herbicide treatments can vary, depending on the herbicide type selected and the method of application, as well as by geographic region, and size and terrain of the application target area. The BLM's estimated application costs for ground applications ranged from $50 to $300 per acre for backpack or ATV applications and $25 to $75 per acre for boom sprayer applications. Aerial applications are estimated at $6 to $40 per acre for fixed-wing aircraft and $25 to $200 per acre for helicopter applications (USDI BLM 2007a).

Payments to State and Local Governments

Where the federal government maintains public land, it makes payments to state and local governments for a variety of purposes. For example, over $219 million in payments have been made to the Nevada's state and local governments during fiscal year 2005 (USDI BLM 2006b).

3.12. Soils

Soils in the valley areas of the RRCNCA have developed on alluvial and colluvial fans of coarse material derived from limestone, sandstone, and granitic materials that have been washed into the valley from the surrounding mountains. Soils that have formed in this area are generally gravelly loams or gravelly sandy loams. Younger soils have formed in the active drainages and there are little or no diagnostic soil horizons (entisols). Older soils on higher ground on ridges between the drainages may contain soils with some developed pedogenic features (aridisols). The limestone and sandstone parent materials have high calcium carbonate content. The dispersal of carbonate material by wind erosion has resulted in carbonate accumulation in almost all soils.

Under the arid conditions little downward movement of the soluble constituents has occurred. Most leaching is confined to the translocation of the soluble material (usually carbonates) from the surface to subsoil, resulting in the formation of a cemented or petrocalcic layer within 1 to 3 feet below the soil surface (USDI BLM 2000). Wind and water erosion is low to moderate, but over time fine particles have been removed from the surface leaving a 1 to 3 inch layer of thick coarse gravel loam or gravelly sandy loam on the surface. Over time weathering has also left few to many rock fragments on the surface. The organic matter content of the soil surface layer is very low, typically less than 0.5 percent. The soils are very fragile and susceptible to ground disturbance from animals, humans, and motorized vehicles.

3.13. Threatened, Endangered or Candidate Wildlife Species

Threatened and endangered species are placed on a federal list by the USFWS and receive protection under the ESA of 1973, as amended. The only threatened or endangered species known to occur in the vicinity of the project area is the threatened desert tortoise.

The Mojave subspecies of the desert tortoise is a federally threatened species that occurs within the Proposed Project area. This long-lived reptile was historically common throughout the Mojave Desert, but has declined substantially throughout much of its range. The decline is attributed to a number of factors, including upper-respiratory tract disease, loss of habitat, predation by the common raven, and direct disturbance by humans.

The habitat requirements needed for a desert tortoise to survive include sufficient suitable plants for forage and cover, suitable substrates for burrow and nest sites, and freedom from disturbance. In the Mojave Desert, the desert tortoise occurs primarily on flats and bajadas with soils ranging from sand to sandy-gravel characterized by scattered shrubs and abundant inter-shrub space for herbaceous plant growth. They are also found on rocky terrain and slopes. The desert tortoise comes out of hibernation during the month of March and returns to hibernation in November depending on temperature. Past monitoring data in Southern Nevada shows that tortoise activity peaks in April, May, September and October.

Historical survey data indicates that the majority of the project occurs in habitat classified as having very low tortoise density, and a few areas are classified as low or moderate.

3.14. Vegetation Excluding Federally Listed Species

The Proposed Project area is within the creosote-bursage and blackbrush communities. The creosote-bursage community is largely composed of the Sonora-Mojave creosote-bursage desert

scrub Southwest Regional Gap Analysis Project (SWReGAP) Landcover category (Kepner et al 2005). In the planning area, the blackbrush community is mostly composed of Mojave mid-elevation mixed desert scrub SWReGap Landcover category.

Creosote-bursage scrub is the most abundant vegetation type in the Southern Nevada District. Creosote and white bursage (*Ambrosia dumosa*) are generally the most conspicuous plant species present. This vegetation community occurs below 4,000 feet and is the primary habitat for the threatened desert tortoise. Within the Proposed Project area, this vegetation category is composed entirely of the Sonora-Mojave creosote-bursage desert scrub ecosystem. This vegetation consists of large open expanses of vegetation, including dispersed cactus and yucca, that gradually integrates with saltbush scrub near valley bottoms and blackbrush at higher elevations. Predominate threats to this ecosystem include direct and indirect impacts resulting from anthropogenic activity, invasion by non-native annual grasses and increased fire frequency.

Blackbrush is a slow growing and long-lived (up to 400 years) densely branched shrub that gets its name from its dark stems and branches that appear even darker when the shrub is dormant. Blackbrush scrub typically occurs between 1,900-5,200 ft. elevation at the transition between creosote scrub and higher elevation sagebrush scrub. Infrequent seed production (every five to seven years) and high seed predation are major factors that limit recovery following fire. Competition by non-native annual grasses further decreases recovery. Invasive non-native annual grasses and increased fire frequency are the most significant threat to this community.

3.15. Visual Resources

In 1976, the Federal Land Policy and Management Act was passed, resulting in part in the placement of visual resources on an equal basis with other resources. This makes the consideration of scenic resources mandatory when planning land use activities. Visual Resource Inventory (VRI) classes are designated following a comprehensive on the ground survey of the landscape which takes into account the scenic quality of the area, viewer sensitivity, and distance zones (how much of an area can be seen from popular roads or destinations). Once an inventory class is established, a Visual Resource Management (VRM) Class is designated through a Land Use Plan (LUP) (VRM Class I, II, III, or IV). The VRM Class takes the VRI Class and adjusts it if necessary based on other resource allocations. Once a VRM Class is designated, projects are evaluated to ensure that they meet the specific goals and objectives of that VRM Class. Mitigation for VRM may be added to a project as necessary. RRCNCA is largely comprised of VRM Class II, designated as such for its outstanding scenic quality, high viewer sensitivity, and high visibility. There are also small portions of Class III and Class IV within the project area. The goal for VRM Class II is to retain the existing character of the landscape. Levels of contrast created by a project should be low and the project should strive to replicate the basic elements of form, line, color, and texture found in the landscape in order to minimize visual impacts. The activity may be visible but should not attract the attention of the casual observer.

According to the RRCNCA RMP (USDI BLM 2005), scenic viewing is the activity that attracts the highest percentage of visitors to the area. A study completed in 1992 (Outdoor Recreation and Wilderness Assessment Group ORWAG) found that even when involved in other activities, including biking/running, hiking, rock climbing and picnicking/day use, the primary reason for participating in these activities at RRCNCA is the scenery.

The characteristic landscape of RRCNCA is dominated by rugged vertical escarpments and contrasting horizontal rolling hills. A wide array of color and texture add to the visual complexity

of this landscape, ranging in hues from dark greys and greens, to bright reds. In addition to these characteristic landforms, vegetation adds a strong visual component to the landscape. Vegetation varies in color and form ranging from dark shrubby blackbrush, to tall green Joshua trees, and annual vegetation with a wide array of flower colors throughout the year. Wildflower viewing and photography is a popular activity in the RRCNCA.

Five Key Observation Points (KOPs) where chosen to analyze the level of contrast that would be created by implementing the Proposed Action, Alternative B (Mechanical Mowing), Alternative C (Mechanical Blading), or No Action Alternative. KOPs were chosen based on where the most visitors are likely to see the effects of the Proposed Action. KOP #1 is a linear KOP driving along State Route 159 between the entrance and exit of the Scenic Drive. KOP #2 is from the scenic overlook along State Route 159. KOP #3 is at the high point overlook on the Scenic Drive. KOP #4 is from the community of Blue Diamond. KOP #5 is from the Moenkopi Road campground. Contrast Rating Analyses were performed for each alternative at each KOP. The results are discussed in the Environmental Effects section of this document.

3.16. Wetland/Riparian

Executive Order 11990 in furtherance of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), in order to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative, directs federal agencies to analyze the impacts to wetland/riparian zones.

The BLM classifies wetland/riparian areas as being inundated or saturated by surface or groundwater at a frequency and duration necessary to support a prevalence of vegetation typically adapted for life in saturated soil conditions. These areas exhibit vegetation or physical features that demonstrate the influence of permanent surface or subsurface water, such as lands adjacent to perennially or intermittently flowing spring streams. Riparian areas are crucial wildlife habitat furnishing food, water, shelter, predation opportunities and transportation corridors to a multitude of species. Within the RRCNCA many bat, bird, raptor and amphibian species are especially dependent upon such riparian habitats. Riparian areas produce greater biomass and offer more habitat differentiation than upland dry habitats. This explains why these riparian areas harbor the greatest proportion of rare, sensitive and special status species found in RRCNCA. The riparian vegetation in RRCNCA is predominately confined to narrow corridors along the immediate stream courses.

3.17. Wild Horses/Burros

On December 15, 1971, Congress enacted the Wild Free-Roaming Horses and Burros Act, authorizing BLM to manage wild horses and burros on public lands. The Act mandated that wild and free-roaming horses and burros be protected from unauthorized capture, branding, harassment, or death. These animals are to be considered an integral part of the natural system, based on their distribution at the time the law was enacted.

The Proposed Project area is in the Red Rock HMA. The 2011 estimated adult population is 45–54 wild burros and 48–58 wild horses. Wild burros primarily live north of State Route 160 and the wild horses are generally south of State Route 160. Future fuel reduction projects will need to be evaluated on an individual case-by-case basis.

3.18. Wilderness

The United States Congress established the National Wilderness Preservation System to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States. Wilderness designation is intended to preserve and protect certain lands in their natural state. Only Congress, with Presidential approval, may designate areas as Wilderness. The Wilderness Act of 1964 defines wilderness characteristics, the uses of wilderness, and the activities prohibited within wilderness. Wilderness areas provide a contrast to lands where human activities dominate the landscape. Wilderness areas are managed for the use and enjoyment of the American people in a manner that will leave them unimpaired for future use and enjoyment as wilderness, for their protection, for the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.

Located 12 miles west of Las Vegas the La Madre Mountain Wilderness contains a rugged complex of canyons, ridges and mountain peaks. La Madre Mountain dominates the area with spectacular cliffs and steep canyons occurring on its southeast flanks. Elevations range from 3,600 feet in Brownstone Basin to 9,600 feet at La Madre Mountain. The large variation in elevation (6,000 feet) provides for a variety of plant communities, ranging from south Mojave Desert shrub, to juniper (*Juniperus sp.*)-pinyon pine (*Pinus monophylla*) woodland, to subalpine communities of white fir (*Abies concolor*) and ponderosa pine (*Pinus ponderosa*). The area is highly scenic and offers excellent views of classic basin and range formations. The Keystone thrust formation above Brownstone Basin, where older limestone has been pushed over younger sandstone, is internationally regarded as the single finest example of a thrust fault. The area contains crucial summer habitat for bighorn sheep. A small herd of elk (*Cervus elaphus*) also use the area. Prehistoric sites occur throughout the area and include pictographs and petroglyphs, agave roasting pits and rock shelters. Brownstone Canyon is listed on the National Register of Historic Places.

Located twelve miles west of Las Vegas, the Rainbow Mountain Wilderness contains vertical red and buff sandstone cliffs, capped by limestone in some areas, are deeply incised by narrow, twisting and heavily vegetated canyons. The area contains one perennial stream. Elevations range from 4,400 feet in the canyon bottoms to 7,000 feet at the top of the escarpment. The area's unique geology and micro-climate support a variety of plant communities, including endemic communities. There are rocky outcrops with pockets of ponderosa pine, pinyon pine , and juniper willow (*Salix sp.*), ash (*Fraxinus sp.*), and hackberry (*Celtis reticulata*) cover canyon bottoms. The deep, cool canyons support endemic chain ferns that reach six feet high and stands of ponderosa pine that grow at unusually low elevations. There are also high concentrations of rock art within Rainbow Mountain Wilderness, including petroglyphs and pictographs. The cross-bedding of ancient sand dunes and the limestone formations of the Keystone Overthrust are of geologic and paleontological interest.

3.19. Wildlife Excluding Federally Listed Species

The RRCNCA supports a rich community of nearly 300 diverse wildlife species. The project area supports wildlife characteristic of the northeastern Mojave Desert. Biological diversity varies according to topography, plant community, and proximity to water, soil type, and season. Many of these species have adapted complex life strategies for survival in the desert environment.

Wildlife species that have the potential to occur throughout the project area include mammals, birds, reptiles, and amphibians. Based on ecological sensitivity factors, three groups of priority management concern are the bats, raptors, and reptiles and amphibians.

Several common species of reptiles are represented in the surrounding habitat types. These species include the western whip-tail (*Cnemidophorous tigris*), desert iguana (*Dipsosaurus dorsalis*), side-blotched lizard (*Uta stansburniana*), zebra-tail lizard (*Callisaurus draconoides*), desert tortoise, western shovel-nosed snake (*Chionactis occipitalis*) and garter snake (*Thamnophis sp.*).

Common bird species that are represented include the rock wren (*Salpinctes obsoletus*), black-throated sparrow (*Amphispiza quinquestriata*), turkey vulture (*Cathartes aura*), common raven (*Corvus corax*), phainopepla (*Phainopepla nitens*), red-tailed hawk (*Buteo jamaicensis*) and western burrowing owl.

Common small mammals that occur in the RRCNCA include cactus mice (*Peromyscus eremicus*), Merriam kangaroo rats (*Dipodomys merriami*), and species associated with rocky habitats such as the desert woodrat (*Neotoma lepida*).

Common mammal species include the black-tailed hare (*Lepus californicus*), and the desert cottontail (*Sylvilagus audubonii*). Other RRCNCA mammals include foxes, coyotes, ringtails (*Bassariscus astutus*), badgers (*Taxidea taxus*), bobcats (*Felis rufus*) and mountain lions (*Felis concolor*). The ungulate species include mule deer (*Odocoileus hemionus*), bighorn sheep and elk.

These species rely on the habitat in which they live to support their survival. Ecosystems that provide valuable ecological functions, such as native vegetation to build and maintain nests, dens, and forage are necessary to support local wildlife populations.

Chapter 4. Environmental Effects

The Environmental Effects section describes the potential effects of the Proposed Action, Alternatives and No Action Alternative on the environmental resources within the project area. This section provides analysis of the environmental consequences of the Proposed Action and Alternatives to determine if the Proposed Project will require further investigation to determine the significance of impacts.

4.1. Resource Issue Impacts

Resource issue impacts describes whether the Proposed Action, Alternatives or No Action Alternative would have direct or indirect effects on a resource. Direct effects are effects which are caused by the action and occur at the same time and place. Indirect effects are those effects which are caused by the action and are later in time or farther removed in distance, but still in the reasonably foreseeable future.

4.1.1. Air Quality

4.1.1.1. Proposed Action

The Proposed Action would help to prevent future erosion of the overall project area, by encouraging healthy vegetation growth of native plant species, which serves to stabilize soil, providing proper drainage and water infiltration during seasonal precipitation, therefore reducing fugitive dust emissions and protecting air quality.

4.1.1.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) would treat and remove fuels in a smaller portion (approximately 52%) of the project area and would create fuel breaks in some areas, reducing fire intensity and provide barriers which would slow or stop large scale wildfires from burning out of control or spreading to areas which could impact public safety and the safety of firefighters, as well as, reducing opportunities for invasive plant species to compete with native vegetation. In addition, this alternative would temporarily increase fugitive dust emissions in the project area; however, the increase would be negligible.

4.1.1.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) would treat and remove fuels in a smaller portion (approximately 52%) of the project area and would create fuel breaks in some areas, reducing fire intensity and provide barriers which would slow or stop large scale wildfires from burning out of control or spreading to areas which could impact public safety and the safety of firefighters, as well as, reducing opportunities for invasive plant species to compete with native vegetation. In addition, this alternative would likely cause more significant and longer term increases in fugitive dust emissions due to additional soil disturbance in the project area.

4.1.1.4. No Action Alternative

Under the No Action Alternative, invasive non-native plant species would continue to dominate the landscape, out-competing native plant vegetation, increasing the possibility of widespread,

high-intensity fires degrading the overall environmental health of the region and increasing soil erosion and fugitive dust emissions, resulting in poor air quality.

4.1.2. BLM Sensitive Plant Species

4.1.2.1. Proposed Action

Yellow Two-tone Beardtongue (*Penstemon bicolor ssp. bicolor*)

The Proposed Action would affect up to 2,114 acres of yellow two-tone beardtongue habitat in RRCNCA. Using herbicide to create fuel breaks could result in the removal or damage to individual yellow two-tone beardtongue plants. Under most circumstances, the loss of individuals causes decreased seed production and recruitment which in turn leads to reduced populations.

Recurrent treatments necessary to maintain the fuel breaks would prevent the establishment of new yellow two-tone beardtongue plants. Treatment areas would no longer offer viable habitat for the species therefore potential habitat could be lost.

Also, yellow two-tone beardtongue can persist in the soil seed bank for many years before germinating; therefore a single survey cannot reliably identify all potential occurrences. Unless routine seasonal surveys are conducted to identify the presence of penstemon it will remain unknown whether or not the species occurs and if there is a viable seed bank within the Project area.

Blue Diamond Cholla (*Cylindropuntia whipplei var. multigeniculata*)

All known populations of the Blue Diamond cholla are located outside of the Proposed Action areas. No direct impacts are expected. The nearest known population is located on Blue Diamond Hill in proximity to the Proposed Project area. In general, cacti are extremely sensitive to herbicide. Drift from aerial herbicide applications could result in the mortality or injury to individual Blue Diamond cholla plants outside of the intended treatment areas.

4.1.2.2. Alternative B (Mechanical Mowing)

Yellow Two-tone Beardtongue (*Penstemon bicolor ssp. bicolor*)

Alternative B (Mechanical Mowing) would affect up to 2,114 acres of yellow two-tone beardtongue habitat in RRCNCA. Mowing to create fuel breaks could result in the removal or damage to individual yellow two-tone beardtongue plants. Under most circumstances, the loss of individuals causes decreased seed production and recruitment which could reduce populations.

Recurrent treatments necessary to maintain the fuel breaks would prevent the establishment of new yellow two-tone beardtongue plants. Treatment areas would no longer offer viable habitat for the species, therefore potential habitat could be lost.

Also, yellow two-tone beardtongue can persist in the soil seed bank for many years before germinating; therefore a single survey cannot reliably identify all potential occurrences. Unless routine surveys are conducted to identify the presence of penstemon it will remain unknown whether the species occurs and if there is a viable seed bank within the area of mowing.

4.1.2.3. Alternative C (Mechanical Blading)

Yellow Two-tone Beardtongue (*Penstemon bicolor ssp. bicolor*)

Alternative C (Mechanical Blading) would affect up to 2,114 acres of yellow two-tone beardtongue habitat in RRCNCA. Blading fuel breaks could result in the removal or damage to individual yellow two-tone beardtongue plants. Under most circumstances, the loss of individuals causes decreased seed production and recruitment which could reduce populations.

Recurrent treatments necessary to maintain the fuel breaks would prevent the establishment of new yellow two-tone beardtongue plants. Treatment areas would no longer offer viable habitat for the species, therefore potential habitat could be lost.

Also, yellow two-tone beardtongue can persist in the soil seed bank for many years before germinating, therefore a single survey cannot reliably identify all potential occurrences. Unless routine surveys are conducted to identify the presence of penstemon it will remain unknown whether the species occurs and if there is a viable seed bank within the area of blading.

4.1.2.4. No Action Alternative

Under the No Action Alternative no treatments would be implemented. Likewise, there would be no direct impacts to BLM Sensitive Plant Species.

4.1.3. BLM Sensitive Wildlife Species

4.1.3.1. Proposed Action

Mammals

Desert Bighorn Sheep (*Ovis canadensis*)

Desert bighorn sheep habitat occurs adjacent to the Proposed Project area. Animals may seek cover on steep slopes and ridges to avoid vehicular activity and associated noise pollution. Solitude-dependent species, such as the desert bighorn sheep, may abandon the area if human activities reduce the quality of their habitat. There should be no direct loss of individuals from the Proposed Project. However, there would be a loss of foraging habitat.

Bats

The sensitive species of bats would not be directly effected, but foraging habitat could be reduced. Springs within the Proposed Project area, which are important water sources for bats, could be altered by herbicide drift if avoidance measures are not observed.

Reptiles

Snakes

Suitable habitat used for nesting, foraging, and cover occurs within and adjacent to the Proposed Project area, and may be decreased as a result of the Proposed Action. Snakes may be injured or killed if they move into the area during treatment activities.

Banded Gila Monster (*Heloderma suspectum*) and **Western Chuckwalla** (*Sauromalus obesus*)

Banded Gila monster and western chuckwalla may be injured or killed if they move into the area during activity. There is potential for the loss of habitat used for foraging and cover.

Birds

Potential suitable habitat used for nesting, foraging and cover habitat occurs within and adjacent to the Proposed Project area, and may be decreased as a result of the Proposed Action. Direct loss of individuals is not anticipated as the Proposed Action would create a nominal amount of surface disturbance and avoidance measures will be implemented.

Invertebrates

Springsnails

Springsnails are found in Red Springs, Willow Springs, Lost Creek and La Madre Spring. Springs adjacent to the Proposed Project area could be altered by herbicide drift if not prevented by avoidance measures.

4.1.3.2. Alternative B (Mechanical Mowing)

Mammals

Desert Bighorn Sheep (*Ovis canadensis*)

Desert bighorn sheep habitat occurs adjacent to the project area. Animals may seek cover on steep slopes and ridges to avoid vehicular activity and associated noise pollution. Solitude-dependent species, such as the desert bighorn sheep, may abandon the area if human activities reduce the quality of their habitat. There should be no direct loss of individuals from Alternative B (Mechanical Mowing). However, there would be a loss of foraging habitat.

Bats

The sensitive species of bats would not be directly effected, but foraging habitat could be reduced.

Reptiles

Snakes

Suitable habitat used for nesting, foraging, and cover occurs within and adjacent to the Project area may be decreased as a result of Alternative B (Mechanical Mowing). Snakes may be injured or killed if they move into the area during treatment activities.

Banded Gila Monster (*Heloderma suspectum*) and **Western Chuckwalla** (*Sauromalus obesus*)

Banded Gila monster and western chuckwalla may be injured or killed if they move into the area during Alternative B (Mechanical Mowing). There is potential for the loss of habitat used for forage and cover.

Birds

Suitable habitat used for nesting, foraging and cover habitat occurs within and adjacent to the Proposed Project area, and may be decreased as a result of Alternative B (Mechanical Mowing).

Direct loss of individuals is not anticipated as birds tend to move out of harm's way and they would be protected by mitigation measures for migratory birds.

Invertebrates

Springsnails

Springsnails are found in Red Springs, Willow Springs, Lost Creek and La Madre Spring. Alternative B (Mechanical Mowing) should not have a direct effect on the springs or springsnails.

4.1.3.3. Alternative C (Mechanical Blading)

Mammals

Desert Bighorn Sheep (*Ovis canadensis*)

Desert bighorn sheep habitat occurs adjacent to the project area. Animals may seek cover on steep slopes and ridges to avoid vehicular activity and associated noise pollution. Solitude-dependent species, such as the desert bighorn sheep, may abandon the area if human activities reduce the quality of their habitat. There should be no direct loss of individuals from Alternative C (Mechanical Blading). However, there would be a loss of foraging habitat.

Bats

The sensitive species of bats would not be directly affected, but foraging habitat could be reduced.

Reptiles

Snakes

Suitable habitat used for nesting, foraging, and cover occurs within and adjacent to the Proposed Project area, and may be decreased as a result of Alternative C (Mechanical Blading). Snakes may be injured or killed if they move into the area during treatment activities.

Banded Gila Monster (*Heloderma suspectum*) and **Western Chuckwalla** (*Sauromalus obesus*)

Banded Gila monster and western chuckwalla may be injured of killed if they move into the area of Alternative C (Mechanical Blading). There is the potential for the loss of habitat used for foraging and cover.

Birds

Suitable habitat used for nesting, foraging and cover habitat occurs within and adjacent to the Proposed Project area, and may be decreased as a result of Alternative C (Mechanical Blading). Direct loss of individuals is not anticipated as birds tend to move out of harm's way and they would be protected by mitigation measures for migratory birds.

Invertebrates

Springsnails

Springsnails are found in Red Springs, Willow Springs, Lost Creek and La Madre Spring. Alternative C (Mechanical Blading) would not have a direct effect on the springs or springsnails.

4.1.3.4. No Action Alternative

If this project was not completed there would be no immediate harmful effects toward BLM Sensitive Wildlife Species. However, there would be a potential for more wildlife habitat including desert tortoise habitat to burn if these fuel breaks were not installed.

4.1.4. Floodplains

4.1.4.1. Proposed Action

Potential direct and indirect effects of the Proposed Action were not significant enough to necessitate further analysis of Floodplains.

4.1.4.2. Alternative B (Mechanical Mowing)

Potential direct and indirect effects of Alternative B (Mechanical Mowing) were not significant enough to necessitate further analysis of Floodplains.

4.1.4.3. Alternative C (Mechanical Blading)

Potential direct and indirect effects of the Alternative C (Mechanical Blading) were not significant enough to necessitate further analysis of Floodplains.

4.1.4.4. No Action Alternative

Any significant storms could result in flooding hazards that would cause significant damage across the Proposed Project area and could potentially cause significant localized destruction, especially following a vegetation consuming wildfire. Wildfire is likely to change or alter the accuracy of surface water modeling on alluvial fans and increase the associated flood hazards. Catastrophic flooding would occur during precipitation events following a wildfire in the project area. Public safety would be decreased and both government and private structures would remain at risk.

4.1.5. Fuels/Fire Management

4.1.5.1. Proposed Action

The Proposed Action would help to prevent future wildfires from burning the remaining sensitive species habitat and vegetation within RRCNCA. Fire size and intensity would be reduced by providing effective barriers to slow or stop large wildfires and provide anchor points and safety zones for suppression resources. Fine fuels that dominate existing fire scars would be reduced and native vegetation would have the opportunity to re-establish on these areas. Changes in fire regimes and condition classes should stabilize as remaining native vegetation would be protected over time.

4.1.5.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) would help to prevent future wildfires from burning the remaining sensitive species habitat and vegetation within RRCNCA. Fire size and intensity would be reduced by providing effective barriers to slow or stop large wildfires and provide anchor points and safety zones for suppression resources. Fine fuels that dominate existing fire scars would not be reduced and native vegetation would not have the opportunity to re-establish on these areas. Changes in fire regimes and condition classes should stabilize as the remaining native vegetation would be protected over time.

4.1.5.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) could protect remaining sensitive species habitat and vegetation within the RRCNCA from burning in future wildfires. Fire size and intensity would be reduced by providing effective barriers to slow or stop large wildfires and provide anchor points and safety zones for suppression resources. Fine fuels that dominate existing fire scars would not be reduced and native vegetation would not have the opportunity to re-establish on these areas. Changes in fire regimes and condition classes should stabilize as the remaining native vegetation would be protected over time.

4.1.5.4. No Action Alternative

Under the No Action Alternative invasive annual grasses would continue to dominate the landscape and fuel catastrophic wildland fires. Public and firefighter safety would be decreased and both government and private structures would remain at risk. Fire history demonstrates there have been multiple wildfires that have threatened the RRCNCA. Threatened, Endangered, and Sensitive species habitat would remain at high risk for large catastrophic wildfire. Native plant species would remain under the competitive pressure of non-native invasive grasses.

4.1.6. Human Health and Safety

4.1.6.1. Proposed Action

BLM approved herbicides were evaluated in the 2007 Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States, PEIS and ROD. The evaluation included effects to human health and safety. Two herbicide active ingredients analyzed and proposed for use in the Proposed Action are Imazapic and Glyphosate. Imazapic (Plateau®) is a USEPA approved herbicide (USEPA Reg. No. 241–365) and is approved by BLM for use on public lands. The Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States PEIS and ROD (2007) identified two possible receptors to exposure to herbicides; occupational and public receptors. Occupational receptors include workers who mix, load, and apply herbicides. Public receptors would include the public likely to come into contact with herbicides such as ranchers, hunters, and other public land users. According to the MSDS (BASF 2010a), Plateau® does not cause cancer, is unlikely to cause birth defects, and did not interfere with reproduction based on laboratory animal studies. Journey® (a combination of Imazapic and Glyphosate) is a USEPA approved herbicide (USEPA Reg. No. 241–417) and is approved by BLM for use on public lands. According to the MSDS (BASF 2010b), Journey® does not cause cancer, is unlikely to cause birth defects, and did not interfere with reproduction based on laboratory animal studies.

Analysis for public health and safety references and tiers to the Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States PEIS and ROD (2007) as provided for under the CEQ regulations at 40 CFR 1508.28. Impacts from the use of herbicides are presented in Volume 1, Chapter 4, pages 4-1 to 4-253.

Potential health effects from application of herbicide would be minimal due to the low rates of application, the size of the areas being treated, implementation of SOPs (See Appendix B SOPs for Herbicide Application) and following all label directions as required by the Federal Insecticide, Fungicide and Rodenticide Act. In general, the Proposed Action would be beneficial to the public because it would limit the growth of wildfire protecting residents who live in Calico Basin, Bonnie Springs Old Nevada and Blue Diamond, public and private structures, infrastructure, and people using the area for recreation.

The use of herbicides to create fuel breaks would increase public and firefighter safety by reducing the threat of catastrophic wildland fire and the effects of smoke on downwind receptors and on heavily travelled roadways (State Route 159 and the Scenic Drive). Both public and private structures would have defensible space around them further increasing public health and safety.

4.1.6.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) to install fuel breaks would increase public and firefighter safety by slightly reducing the threat of catastrophic wildland fire and the effects of smoke on downwind receptors and on heavily travelled roadways (State Route 159 and the Scenic Drive). Both public and private structures would have defensible space around them further increasing public health and safety.

4.1.6.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) to create fuel breaks would increase public and firefighter safety by greatly reducing the threat of catastrophic wildland fire and the effects of smoke on downwind receptors and on heavily travelled roadways (State Route 159 and the Scenic Drive). Both public and private structures would have defensible space around them further increasing public health and safety.

4.1.6.4. No Action Alternative

Under the No Action Alternative there would be no direct or indirect impacts to public health and safety. However in the event of a large, fast moving wildfire public safety may be compromised, public and private structures and infrastructure would remain at risk of loss.

4.1.7. Hydrologic Conditions (Including Water Quality)

4.1.7.1. Proposed Action

Direct and indirect effects of the Proposed Action were not significant enough to necessitate further analysis of Hydrologic Conditions (Including Water Quality).

4.1.7.2. Alternative B (Mechanical Mowing)

There were not direct and indirect effects of Alternative B (Mechanical Mowing) that necessitated further analysis for these resources.

4.1.7.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) has the potential to alter the hydrologic conditions (Including Water Quality) within RRCNCA, as it would alter surface run off patterns, infiltration rates, evapotranspiration rates, precipitation interception rates, and erosion. The disturbance associated with Alternative C (Mechanical Blading) will increase erosion on and off-site, thereby increasing sediment loads in surface runoff, altering the discharge and retention rates of water and change the velocity of water moving through the system. This could result in the degradation of surface water quality, as well as flow events exceeding the capacity of constructed detention basins.

4.1.7.4. No Action Alternative

The disturbance associated with wildfire will increase erosion on and off-site, thereby increasing sediment loads in surface runoff, altering the discharge and retention rates of water and change the velocity of water moving through the system. This could result in the degradation of surface water quality, as well as flow events exceeding the capacity of constructed detention basins

Another wildfire in the project area could have serious impacts to the hydrologic conditions (Including Water Quality). Current vegetation regimes are likely to create hydrophobic soils, which, in turn, would prevent the local aquifer from properly recharging, ultimately causing local springs to become dry or less productive. This would occur to a lesser extent even if hydrophobic soils were not created.

4.1.8. Invasive Species/Noxious Weeds

4.1.8.1. Proposed Action

Additional non-native invasive species could be introduced and spread within the Proposed Project area by equipment, applicators and/or ground disturbing activities associated with the Proposed Action. Documented weed infestations within RRCNCA are generally within the Proposed Action area; however to date, there have only been two approved herbicide treatments within RRCNCA (experimental treatments within the Loop Fire and the RRCNCA Fire Station project [2011]). Many of the non-native invasive species that have been documented within RRCNCA, such as mustards and thistles, are susceptible to Journey® and could be controlled during the Proposed Action along with targeted non-grasses. The Proposed Action would provide ongoing treatment of these non-targeted weed populations likely resulting in an overall positive impact by reducing target and non-target weed populations. Indirect impacts of the Proposed Action would be a possible reduction in the extent of wildfire, which in turn would reduce the spread potential of invasive non-native species following wildfire.

4.1.8.2. Alternative B (Mechanical Mowing)

The management of weeds in the NCA is guided by the RRCNCA RMP and ROD (2005) with the following objectives for vegetation management.

1. 1E.3., Eradicate non-native species with emphasis on tamarisk removal.

2. 3.2 Maintain or improve the condition of vegetation to its PNC by maintaining a canopy cover of 20% (minimum), a basal cover of 5% (minimum) perennial native grass species, and manage for perennial native grass species composition (by dry weight) of 5-10%, as limited by PNC.

Removing canopy cover during Alternative B (Mechanical Mowing) would not be in compliance with the Plan. Non-native, invasive plant material and seeds would be spread during Alternative B (Mechanical Mowing), likely introducing additional weed species throughout the treatment area.

4.1.8.3. Alternative C (Mechanical Blading)

Weed management in the NCA is guided by the RRCNCA RMP and ROD (2005) with the following objectives

1. 1E.3., Eradicate non-native species with emphasis on tamarisk removal.

2. 3.2 Maintain or improve the condition of vegetation to its PNC by maintaining a canopy cover of 20% (minimum), a basal cover of 5% (minimum) perennial native grass species, and manage for perennial native grass species composition (by dry weight) of 5-10%, as limited by PNC.

Removing canopy cover during Alternative C (Mechanical Blading) would not be in compliance with the Plan. Additionally, the resulting soil disturbance associated with Alternative C (Mechanical Blading) presents a high risk of weed spread and establishment. More than 15 weed species (in addition to brome), have been documented during weed surveys of RRCNCA. Many of these species occur along trails and roadways within the Proposed Project area. Alternative C (Mechanical Blading) would transport seeds and plant material in addition to disturbing the soil surface, creating ideal establishment conditions for non-native invasive weed species throughout the Proposed Project area. Ultimately, Alternative C (Mechanical Blading) could increase the density and extent of brome species establishment exacerbating the “annual grass/fire cycle” by regularly disturbing soil, preventing native perennial competitors from growing and establishing and distributing seed along Alternative C (Mechanical Blading) treatment areas.

4.1.8.4. No Action Alternative

If the No Action Alternative were selected, brome along with other invasive, non-native species would continue to grow and spread within the Proposed Project area and potentially to adjacent areas as well.

4.1.9. Migratory Birds

4.1.9.1. Proposed Action

Migratory birds, including the BLM Sensitive Species may be present on the Proposed Project area. Depending on the time of year that treatment occurs there is a potential to directly disturb birds by temporarily displacing populations of nesting birds and defoliating nests resulting in nest failures. Indirectly, migratory birds may be impacted by the loss of suitable habitat to utilize for foraging, breeding, and cover.

The long term benefits associated with the Proposed Action, such as a reduction in fine fuels, are beneficial to migratory birds. The fuel breaks have the potential to reduce the size and intensity of wildfires in the area, thereby protecting more suitable habitat than would be lost due to the Proposed Action.

4.1.9.2. Alternative B (Mechanical Mowing)

Migratory birds, including the BLM Sensitive Species may be present on the Proposed Project area. Depending on the time of year that treatment occurs there is a potential to directly disturb birds by temporarily displacing populations of nesting birds and defoliating nests resulting in nest failures. Also there is a potential for direct loss of individuals if birds do not move out of the area while Alternative B (Mechanical Mowing) occurred.

Indirectly, migratory birds may be impacted by the loss of suitable habitat utilized for foraging, breeding and cover.

4.1.9.3. Alternative C (Mechanical Blading)

Migratory birds, including the BLM Sensitive Species may be present on the Proposed Project area. Depending on the time of year that treatment occurs there is a potential to directly disturb birds by temporarily displacing populations of nesting birds and defoliating nests resulting in nest failures. Also there is a potential for direct loss of individuals if birds do not move out of the area during Alternative C (Mechanical Blading).

Indirectly, migratory birds may be impacted by the loss of suitable habitat utilized for foraging, breeding and cover.

4.1.9.4. No Action Alternative

The No Action Alternative would not incur direct harmful effects to migratory birds. However, there is a higher potential for catastrophic wildfire to burn migratory bird habitat if fuel breaks were not installed.

4.1.10. Recreation

4.1.10.1. Proposed Action

The majority of the Proposed Action would occur during a high-use period (fall). RRCNCA closures could severely impact the financial viability of the conservation area. The RRCNCA budget is made up of more than 80% of monies collected from entrance fees and special recreation permits. When the Scenic Drive is closed an average of $500 per hour is lost from casual use entrance fees. A minimum of 25 permittees per day could also experience a loss of revenue from the decrease in SRPs fees paid to the BLM. Visitor use in the campground could also decrease as a result of visitors who are not comfortable being in close proximity to herbicide related activities.

Although the entire RRCNCA may not be closed to casual recreation users during the Proposed Action, closures and/or encounters with those applying herbicide may affect the users' experience. There is also potential for visitors to be sensitive to the chemical used throughout the project area.

In areas that remain open to the public trail widening and surface disturbance at designated parking areas could occur from visitors going off trail in order to avoid herbicide activities. Trail widening has the potential to increase erosion which could cause maintenance issues and affect the overall recreational experience. It could also contribute to potential conflicts between recreational users.

Other effects may include a reduction in parking, limited access to trailheads, and a decrease in the opportunity for solitude on the trails or developed sites due to the Proposed Action.

The use of the Pine Creek parking area as a heli-base, especially if this area is closed to the public, would create a large user conflict as this is the most popular trail head for climbers and hikers year-round.

4.1.10.2. Alternative B (Mechanical Mowing)

The majority of Alternative B (Mechanical Mowing) would occur during a high-use period (fall). RRCNCA closures could severely impact the financial viability of RRCNCA. The RRCNCA budget is made up of more than 80% of monies collected from entrance fees and SRPs. When the Scenic Drive is closed an average of $500 per hour is lost from casual use entrance fees. A minimum of 25 permittees per day could also experience a loss of revenue from the decrease in SRP fees paid to the BLM. Visitor use in the campground could also decrease as a result of visitors who are not comfortable being in close proximity to Alternative B (Mechanical Mowing) activities.

Although the entire RRCNCA may not be closed to casual recreation users during Alternative B (Mechanical Mowing), closures and/or encounters with Alternative B (Mechanical Mowing) may affect the users' experience. There is also potential for visitors to be sensitive to the airborne dust and vegetative stubble generated by the activity.

In areas that remain open to the public trail widening and surface disturbance at designated parking areas could occur from visitors going off trail in order to avoid Alternative B (Mechanical Mowing) activities. Trail widening has the potential to increase erosion which could cause maintenance issues and affect the overall recreational experience. It could also contribute to potential conflicts between recreational users.

Other effects may include a reduction in parking, limited access to trailheads, and a decrease in the opportunity for solitude on the trails or developed sites due to the noise generated by Alternative B (Mechanical Mowing).

4.1.10.3. Alternative C (Mechanical Blading)

The majority of Alternative C (Mechanical Blading) would occur during a high-use period (fall). Alternative C (Mechanical Blading) would occur over a longer period of time than other Alternatives, resulting in an extended time of direct visitor experience impacts in addition to the slow regrowth of vegetation afterwards.

RRCNCA closures could severely impact the financial viability of RRCNCA. The RRCNCA budget is made up of more than 80% of monies collected from entrance fees and special recreation permits. When the Scenic Drive is closed an average of $500 per hour is lost from casual use entrance fees. A minimum of 25 permittees per day could also experience a loss of revenue from the decrease in SRP fees paid to the BLM. Visitor use in the campground could also decrease as a result of visitors who are not comfortable being in close proximity to Alternative C (Mechanical Blading) activities.

Although the entire RRCNCA may not be closed to casual recreation users during Alternative C (Mechanical Blading), closures and/or encounters with those performing Alternative C (Mechanical Blading) may affect the users' experience. There is also potential for visitors to be sensitive to the airborne dust and weeds generated by the activity.

In areas that remain open to the public trail widening and surface disturbance at designated parking areas could occur from visitors going off trail in order to avoid Alternative C (Mechanical Blading) activities. Trail widening and perennial vegetation removal can increase erosion which could cause maintenance issues and affect the recreational experience of the trail. It could also contribute to potential conflicts between recreational users.

Interpretive, informational and directional signs would need to be removed, reducing the ability of participants to find trails and get important information. This disturbance would take time to mitigate resulting in increased difficulty in route finding.

Other effects may include a reduction in parking, limited access to trailheads, and a decrease in the opportunity for solitude on the trails or developed sites due to the noise generated by Alternative C (Mechanical Blading).

4.1.10.4. No Action Alternative

Under the No Action Alternative, the invasive plants would continue to thrive in RRCNCA and change the Mojave Desert landscape, and may reduce outdoor recreation opportunities and visual aesthetics for the public.

The majority of casual use occurs during the spring and fall. The No Action Alternative would result in fewer disturbances to the user's experience. Parking may be less of an issue at the trail heads and the opportunity for solitude on the trail may increase. Trail widening could still occur from casual users going off trail. Less official visitation of the area could result in increased damage and vandalism of facilities. This negative experience would affect the recreational user's experience of the trail.

Under the No Action Alternative an opportunity to increase public knowledge of the "annual grass/fire cycle" would be missed. The No Action Alternative could result in a loss of community support if subsequent catastrophic fires radically alter the visual and biological communities which most recreational users come to RRCNCA to experience.

4.1.11. Socio-Economics

Social and Economic Values

Fuel reduction treatments have the potential to affect people, communities, and economies. The susceptibility of these entities to social and economic effects stems from the importance of public lands to the lives of the people and communities. Public lands commonly provide a major portion of economic sustenance for active and passive recreation opportunities and other activities that westerners rely on. The dollar value of the social sustenance may not be readily quantifiable, but it, too, is important to the way of life of westerners. "Wide open spaces" are a tangible part of the experience that attracts and/or retains people who live in western states. The large expanses of federal lands are a significant contributor to the open spaces that define the "sense of place" in many parts of the West. Through support of economies and the social context of the West, federal lands are highly important to the western states. Actions that affect federal lands, such as fuel reduction treatments, have the potential to affect the economic and social environment of the region.

Local level stakeholders include people in communities located in the vicinity of public lands, such as adjacent landowners, local businesses, and users of public lands (e.g. recreationists), as well as the counties and states that benefit from BLM revenues. National level stakeholders include all taxpayers, whose tax dollars support BLM programs and who have partial "ownership" of federal public lands. International level stakeholders include tourists, recreationists (e.g. rock climbers, guided horse tour participants), and commercial tour operators. Given the wide range in stakeholders with varied needs and interests, there may be different and often conflicting opinions.

The BLM manages public lands on the basis of multiple use and sustained yield to meet the needs of present and future generations. As the human population continues to increase and social values evolve, resource conflicts are likely to increase. The overall goals of the fuel reduction treatments are to sustain the condition of healthy lands and to restore degraded lands. From the perspective of social and economic issues, the objectives are to accomplish these goals while minimizing adverse effects and optimizing beneficial effects for affected communities. For example, reducing hazardous fuels in the WUI would, over the long term, reduce economic losses from wildland fire. Reducing the spread of invasive plant species would improve the Mojave ecosystem, which would be enjoyable to sightseers and recreationists, and economically beneficial to recreation-oriented businesses.

Economic Environment

Economic effects of fuel reduction treatments on communities could be similar to social effects. Changes in wildfire risk and access or attractiveness for recreation activities could potentially affect employment opportunities and income levels in a community, in either a positive or negative fashion.

Revenues Generated by BLM Land

Commercial activities that occur on public lands could be affected by any of the fuels reduction treatment alternatives. Recreation-based businesses such as outfitters, outdoor gear and equipment rental shops are direct beneficiaries of recreational activity. Other services such as gas stations, restaurants, and hotels that are frequented by recreationists also benefit.

Temporary closure of a popular recreation site would result in temporary losses of revenues to surrounding businesses. In most cases, these effects would be short term in nature, lasting only as long as the site closure. In general, most recreation activities would continue, but would shift to other locations. Depending on the location of the alternate use area, the economic benefits would shift from one community to another. If there were a suitable nearby alternative to the closed site, the effects on the surrounding businesses would be minimal; if not, the businesses would be adversely affected for a period of time.

Recreation provides revenues to the BLM through fees and permits. Closure of the RRCNCA fee-based recreation site would result in a loss of revenues to the BLM. The Scenic Drive fees generated approximately $1,365,234 in 2008 (USDI BLM 2010b); the closure of the Scenic Drive could result in reduced revenue.

Expenditures by the BLM

Fuel reduction treatment would require a large financial investment by the BLM, which would vary by treatment method, location, terrain and other factors. The most cost-effective alternative is the one that produces the greatest benefits for the least amount of financial investment. However, the cheapest method, if it did not substantially improve the health of the land, could require indefinite repeat treatments, thus costing more money over the long term. Benefits to the health of the public lands depend on the specific problem to be addressed in each specific area. Irrespective of the particular alternative selected, the costs associated with restoring or maintaining an ecosystem through fuel reduction treatments is generally much less than the cost of suppressing wildfires and implementing fire rehabilitation programs (USDI BLM 2001).

4.1.11.1. Proposed Action

Under the Proposed Action approximately 4,460 acres are proposed to be treated in specific areas within RRCNCA.

Social/Demographics Environment

Because of the temporary, short-term nature of the Proposed Action limited to specific areas within RRCNCA, it is unlikely to cause substantive changes to existing patterns and trends in population or demographic conditions.

Social effects would depend on people's perceptions about health and safety risks associated with herbicide use for fuel reduction. Data on such perceptions is limited, and, in fact, could differ from one community to another, depending on the level of knowledge about herbicides in the community and possible past experiences with their use (or "misuse," such as accidental spills or damage to non-target plants).

Perceptions and Value

While local data on such perceptions are not available, a 2005 survey of other southwest U.S. communities indicated that the public in general were in favor of fuel reduction treatments, but were more concerned of herbicide use (Tidwell 2005).

The Proposed Action could appeal favorably to individuals with a much greater concern about wildfires or the effects of invasive species by using the most efficient means of attacking fuels reduction problems. Some individuals might be encouraged by plans to employ private contractors for some of the treatment work and could favor the Proposed Action. Individuals who place high values on the health and pristine nature of the land may also prefer herbicide treatment as the least intrusive method to be implemented. Conversely, individuals who have an aversion to chemical use in the environment could find the Proposed Action offensive.

Economic Environment

Employment/Income

Under the Proposed Action , the BLM would require the services of pesticide applicators, pilots, and others, creating jobs and generating income. While there would be some increased employment generated by the BLM acreage treated with herbicides, the jobs would generally be short-term, temporary positions or contracted work, which would not be sufficient to encourage measurable in-migration of workers and their families. With few exceptions, perhaps including pilots and certified herbicide applicators, jobs generated by the increased herbicide treatments program would tend to pay moderate wages.

While most employment and income effects from the Proposed Action would be beneficial, there could be some temporary loss of jobs and income if access to treated areas was restricted for treatment of vegetation. Most closures would be expected to last for no more than 1 day. If long-term closures occurred over large acreages and conflicted with recreation areas, they could result in job losses and associated reductions in income. Employment and income losses would have the greatest effect on smaller communities and stakeholder groups, where alternative employment opportunities would be scarce, and where these losses would represent a larger portion of the economy than they would near larger, more diversified towns and cities.

Regardless of the local economic situation, employment and related income effects would normally be short-term in nature and geographically dispersed, primarily affecting specific communities and stakeholder groups.

There would be direct and indirect economic effects from application of herbicides. These effects would vary, depending on the quantities of each herbicide selected for use and the methods of application for each. Based on data from 2005 herbicide usage, cost differences can range from approximately $ 12 per acre for Plateau® to $ 15 per acre for Journey®.

In addition to the chemical costs, there would be costs for applying the herbicides. Based on 2005 BLM estimates, average cost per acre for ground application ranged from $50 to $300, and aerial applications ranged from $25 to $200 per acre for helicopter applications. The differences are largely due to the variation in labor and time required to cover an acre by each application mode. It takes many more person-hours to treat an acre on foot than to treat an acre with an aircraft. At best, all of these estimates are crude averages; actual costs would vary widely, dictated by terrain, accessibility of the treatment area, size of the problem invasive weed stand being treated, and other factors.

The source of labor for the applications, included in the application cost, would vary with the project. Aerial application projects would be contracted out. Ground applications would be done by a combination of contractors and/or BLM personnel, either by full-time or part-time employees.

Purchase of chemicals and contracting of applications would generate dollars to benefit the economy; the location of the benefit would depend on where the chemicals and contractors were obtained. Locally purchased chemicals would generate more local benefit, whereas mass purchase of chemicals from a state or national distributor would likely have little local benefit. Herbicide application would tend to sustain local employment, and provide temporary employment for others.

Generally, non-herbicide fuel reduction treatment methods tend to be more labor intensive and thus more expensive on a per acre basis in situations where herbicides are preferred, which translates into less effective control of invasive weeds. As a result, more workers could be hired under the Proposed Action.

Limitation on aerial application would preclude treatments in some areas that would not be suitable for ground application due to access difficulties or the scale of invasive weed problems.

Effects on Private Property

Effects from the Proposed Action herbicide treatment on private property from drift and accidental applications could occur, especially during aerial treatments. Over the short term, there would be minor risks for property damage associated with effects of treatments extending beyond public land boundaries onto private property. Generally, losses would be minor and short term in nature, although the relative size of the affected property would be a factor in the degree of damage accruing to the property owner.

Over the long term, a reduction in hazardous fuels on public lands would reduce the likelihood of wildfires migrating from public lands to nearby private property and impacting the WUI.

Herbicide treatment would also reduce the risks of noxious weeds spreading onto neighboring parcels. A reduction in such risks could lead to increased property values over the long term.

Revenues Generated by BLM Lands

Casual use and commercial recreation activities that occur on public lands could be affected by the Proposed Action. Temporary closure of a popular recreation site, either to protect public safety during herbicide treatments or to decrease user-related impacts during the site's post-treatment recovery, would result in temporary losses of revenues to surrounding businesses. In most cases, these effects would be short term in nature, lasting only as long as the site closure.

In general, most recreation activities would continue, but would shift to other locations. Depending on the location of the alternate use area, the economic benefits would shift from one community to another. If there were a suitable nearby alternative to the closed site, the effects on the surrounding businesses would be minimal; if not, the businesses would be adversely affected for a period of time.

Over the long term, an improvement in the quality of a site from fuel reduction treatment could lead to increased recreational usage and a net increase in revenues to surrounding businesses and the federal government.

Reductions in hazardous fuels and the risk of wildfires would benefit the economies of communities and stakeholders, which are often dependent on recreational and wilderness values. In some cases, severe wildfires, particularly those occurring during the tourist season, could cause long-term disruption to recreation values, which would adversely affect recreational businesses. To the degree that treatments would reduce the risk of wildland fires, the Proposed Action would benefit recreation-related economic activity.

Expenditures by the BLM

Wildland Fire Management

The Proposed Action would commit approximately 4,460 acres of the treatment acreage to hazardous fuels reduction. Neither the suppression cost savings, nor the reduction in property losses can be quantified for this specific project because of the number of variables contributing to when and where a fire may start and how much damage it may cause. These factors include weather conditions, terrain, human acts of commission or omission, and structure type and density, among others. Further, it may take several years to build a sufficient experience base of data to quantitatively estimate the benefits of vegetative treatment on wildfire suppression costs and damage reduction.

Despite the lack of quantifiable data, it is expected that herbicide treatments in non-WUI areas would also reduce hazardous fuels, including invasive weeds, which contribute disproportionately to fire risk. It is expected that all of the alternatives would reduce the cost of fire suppression in the backcountry as well as in the WUI.

Payments to State and Local Governments

If herbicide goods and services were purchased locally, or additional workers were hired locally in support of the Proposed Action, state and local governments would benefit through increased tax revenues.

4.1.11.2. Alternative B (Mechanical Mowing)

The area to be mowed would create 2,114 acres of linear fuel break along approximately 65 miles. Alternative B (Mechanical Mowing) locations would be in the same areas as the Proposed Action, excluding fire scar interiors (see map 2.2).

Social/Demographics Environment

Because of the temporary, short-term nature of the Alternative Action limited to specific areas within RRCNCA, Alternative B (Mechanical Mowing) is unlikely to cause substantive changes to existing patterns and trends in population or demographic conditions.

Perceptions and Values

Social effects would depend on people's perceptions about Alternative B (Mechanical Mowing) fuel reduction treatment. While local data on such perceptions are not available, a 2005 survey of other southwest U.S. communities indicated that the public in general were in favor of fuel reduction treatments (Tidwell 2005).

Alternative B (Mechanical Mowing) could appeal favorably to individuals with a much greater concern about wildfires or the effects of invasive species. Some individuals might be encouraged by plans to employ private contractors for some of the treatment work and could favor Alternative B (Mechanical Mowing). Individuals who place high values on the health and pristine nature of the land may also prefer Alternative B (Mechanical Mowing) as the least intrusive method to be implemented. Conversely, individuals who have an aversion to any environmental interference from man could find Alternative B (Mechanical Mowing) offensive.

Economic Environment

Employment/Income

Under Alternative B (Mechanical Mowing), the BLM would require the services of certified workers to use equipment to mow the invasive weeds. This could be done by either BLM staff, or by contracted workers. While there would be some increased employment generated by the BLM fuels reduction treatment of Alternative B (Mechanical Mowing), the jobs would generally be short-term, temporary positions or contracted work, which would not be sufficient to encourage measurable in-migration of workers and their families. The jobs generated by Alternative B (Mechanical Mowing) would tend to pay moderate wages.

Alternative B (Mechanical Mowing) fuel reduction treatment method tends to be more labor intensive and thus more expensive on a per acre basis in situations where herbicides are preferred, which translates into less effective control of invasive weeds. As a result, fewer workers would be hired under Alternative B (Mechanical Mowing) .

While most employment and income effects from Alternative B (Mechanical Mowing) would be beneficial, there could be some temporary loss of jobs and income if access to treated areas was restricted for treatment of vegetation. Most closures would be expected to last for no more than five days. If long-term closures occurred over large acreages and conflicted with recreation areas, they could result in job losses and associated reductions in income. Employment and income losses would have the greatest effect on smaller communities and stakeholder groups, where alternative employment opportunities would be scarce, and where these losses would represent a larger portion of the economy than they would near larger, more diversified towns and cities.

Regardless of the local economic situation, employment and related income effects would normally be short-term in nature and geographically dispersed, primarily affecting specific communities and stakeholder groups.

Effects on Private Property

Alternative B (Mechanical Mowing) fuel reduction treatment could affect private property in the vicinity of public lands, particularly parcels adjacent to the treatment areas. Invasive plants mowed may release seeds that could drift to private property and create new growths of invasive plants on adjacent lands. Over the short term, there would be minor risks for property damage associated with effects of treatments extending beyond public land boundaries onto private property. Generally, losses would be minor and short term in nature, although the relative size of the affected property would be a factor in the degree of damage accruing to the property owner.

Over the long term, a reduction in hazardous fuels on public lands would reduce the likelihood of wildfires migrating from public lands to nearby private property and impacting the WUI.

Alternative B (Mechanical Mowing) would also reduce the risks of noxious weeds spreading onto neighboring parcels. A reduction in such risks could lead to increased property values over the long term.

Revenues Generated by BLM Lands

Casual use and commercial activities that occur on public lands could be affected by Alternative B (Mechanical Mowing). Temporary closure of a popular recreation site, either to protect public safety during mowing of invasive plants within the site or to decrease user-related impacts during the site's post-treatment recovery, would result in temporary losses of revenues to surrounding businesses. In most cases, these effects would be short term in nature, lasting only as long as the site closure.

In general, most recreation activities would continue, but would shift to other locations. Depending on the location of the alternate use area, the economic benefits would shift from one community to another. If there were a suitable nearby alternative to the closed site, the effects on the surrounding businesses would be minimal; if not, the businesses would be adversely affected for a period of time.

Over the long term, an improvement in the quality of a site from fuel reduction treatment could lead to increased recreational usage and a net increase in revenues to surrounding businesses and the federal government.

Reductions in hazardous fuels and the risk of wildfires would benefit the economies of communities and stakeholders, which are often dependent on recreational and wilderness values. In some cases, severe wildfires, particularly those occurring during the tourist season, could cause long-term disruption to recreation values, which would adversely affect recreational businesses. To the degree that treatments would reduce the risk of wildland fires, Alternative B (Mechanical Mowing) would benefit recreation-related economic activity.

Expenditures by the BLM

Wildland Fire Management

Neither the suppression cost savings, nor the reduction in property losses can be quantified for this specific project because of the number of variables contributing to when and where a fire may start and how much damage it may cause. These factors include weather conditions, terrain, human acts of commission or omission, and structure type and density, among others. Further, it may take several years to build a sufficient experience base of data to quantitatively estimate the benefits of vegetative treatment on wildfire suppression costs and damage reduction.

Despite the lack of quantifiable data, it is expected that Alternative B (Mechanical Mowing) treatments in non-WUI areas would also reduce hazardous fuels, including invasive weeds, which contribute disproportionately to fire risk. It is expected that all of the alternatives would reduce the cost of fire suppression in the backcountry as well as in the WUI.

Payments to State and Local Governments

If goods and services for Alternative B (Mechanical Mowing) were purchased locally, or additional workers were hired locally in support of Alternative B (Mechanical Mowing), state and local governments would benefit through increased tax revenues.

4.1.11.3. Alternative C: Mechanical (Blading)

The area to be bladed would create 2,114 acres of linear fuel break along approximately 65 miles. Alternative C (Mechanical Blading) locations would be in the same areas as the Proposed Action, excluding fire scar interiors (see map 2.2).

Social/Demographics Environment

Because of the temporary, short-term nature of the Alternative Action limited to specific areas within RRCNCA, Alternative C (Mechanical Blading) is unlikely to cause substantive changes to existing patterns and trends in population or demographic conditions.

Perceptions and Values

Social effects would depend on people's perceptions about Alternative C (Mechanical Blading). While local data on such perceptions are not available, a 2005 survey of other southwest U.S. communities indicated that the public in general were in favor of fuel reduction treatments (Tidwell 2005).

Alternative C (Mechanical Blading) could appeal favorably to individuals with a much greater concern about wildfires or the effects of invasive species. Some individuals might be encouraged by plans to employ private contractors for some of the treatment work and could favor Alternative C (Mechanical Blading). Individuals who place high values on the health and pristine nature of the land may also prefer Alternative C (Mechanical Blading) as the least intrusive method to be implemented. Conversely, individuals who have an aversion to any environmental interference from man could find Alternative C (Mechanical Blading) offensive.

Economic Environment

Employment/Income

Under Alternative C (Mechanical Blading), the BLM would require the services of certified workers to use equipment to blade the invasive weeds. This could be done by either BLM staff, or by contracted workers. While there would be some increased employment generated by the BLM fuels reduction treatment of Alternative C (Mechanical Blading), the jobs would generally be short-term, temporary positions or contracted work, which would not be sufficient to encourage measurable in-migration of workers and their families. The jobs generated by Alternative C (Mechanical Blading) would tend to pay moderate wages.

Alternative C (Mechanical Blading) fuel reduction treatment method tends to be more labor intensive and thus more expensive on a per acre basis in situations where herbicides are preferred, which translates into less effective control of invasive weeds. As a result, fewer workers would be hired under Alternative C (Mechanical Blading).

While most employment and income effects from Alternative C (Mechanical Blading) would be beneficial, there could be some temporary loss of jobs and income if access to treated areas was restricted for treatment of vegetation. Most closures would be expected to last for no more than five days. If long-term closures occurred over large acreages and conflicted with recreation areas, they could result in job losses and associated reductions in income. Employment and income losses would have the greatest effect on smaller communities and stakeholder groups, where

alternative employment opportunities would be scarce, and where these losses would represent a larger portion of the economy than they would near larger, more diversified towns and cities.

Regardless of the local economic situation, employment and related income effects would normally be short-term in nature and geographically dispersed, primarily affecting specific communities and stakeholder groups.

Effects on Private Property

Alternative C (Mechanical Blading) could affect private property in the vicinity of public lands, particularly parcels adjacent to the treatment areas. Invasive plants cut may release seeds that could drift to private property and create new growths of invasive plants on adjacent lands. Over the short term, there would be minor risks for property damage associated with effects of treatments extending beyond public land boundaries onto private property. Generally, losses would be minor and short term in nature, although the relative size of the affected property would be a factor in the degree of damage accruing to the property owner.

Over the long term, a reduction in hazardous fuels on public lands would reduce the likelihood of wildfires migrating from public lands to nearby private property and impacting the WUI.

Alternative C (Mechanical Blading) treatment would also reduce the risks of noxious weeds spreading onto neighboring parcels. A reduction in such risks could lead to increased property values over the long term.

Revenues Generated by BLM Lands

Casual use and commercial recreation activities that occur on public lands could be affected by Alternative C (Mechanical Blading). Temporary closure of a popular recreation site, either to protect public safety during blading and removal of invasive plants within the site or to decrease user-related impacts during the site's post-treatment recovery, would result in temporary losses of revenues to surrounding businesses. In most cases, these effects would be short term in nature, lasting only as long as the site closure.

In general, most recreation activities would continue, but would shift to other locations. Depending on the location of the alternate use area, the economic benefits would shift from one community to another. If there were a suitable nearby alternative to the closed site, the effects on the surrounding businesses would be minimal; if not, the businesses would be adversely affected for a period of time.

Over the long term, an improvement in the quality of a site from fuel reduction treatment could lead to increased recreational usage and a net increase in revenues to surrounding businesses and the federal government.

Reductions in hazardous fuels and the risk of wildfires would benefit the economies of communities and stakeholders, which are often dependent on recreational and wilderness values. In some cases, severe wildfires, particularly those occurring during the tourist season, could cause long-term disruption to recreation values, which would adversely affect recreational businesses. To the degree that treatments would reduce the risk of wildland fires, Alternative C (Mechanical Blading) would benefit recreation-related economic activity.

Expenditures by the BLM

Wildland Fire Management

Neither the suppression cost savings, nor the reduction in property losses can be quantified for this specific project because of the number of variables contributing to when and where a fire may start and how much damage it may cause. These factors include weather conditions, terrain, human acts of commission or omission, and structure type and density, among others. Further, it may take several years to build a sufficient experience base of data to quantitatively estimate the benefits of vegetative treatment on wildfire suppression costs and damage reduction.

Despite the lack of quantifiable data, it is expected that Alternative C (Mechanical Blading) treatments in non-WUI areas would also reduce hazardous fuels, including invasive weeds, which contribute disproportionately to fire risk. It is expected that all of the alternatives would reduce the cost of fire suppression in the backcountry as well as in the WUI.

Payments to State and Local Governments

If goods and services for Alternative C (Mechanical Blading) were purchased locally, or additional workers were hired locally in support of Alternative C (Mechanical Blading), state and local governments would benefit through increased tax revenues.

4.1.11.4. Alternative D: No Action

Under the No Action Alternative, no public lands within RRCNCA would be treated for invasive weeds. With no fuels reduction treatments done on these public lands, positive social benefits could be less than under the other alternatives because wildfire risk reduction in WUI areas would not be as effective. It is likely that fire suppression costs and fire damage losses would be greater under the No Action Alternative than under the other alternatives.

Under the No Action Alternative, invasive plant populations would likely continue to spread, possibly at increasing rates. Related declines in the Mojave ecosystem capacity, combined with the potential for the spread of invasive plants from public lands to private lands, may create greater problems for private property owners.

Social/Demographics Environment

Perceptions and Values

Under the No Action Alternative, the BLM would not use fuel reduction treatments to treat invasive plants. Positive social benefits could be less than under the other alternatives because wildland fire risk reduction in WUI areas would not be as effective and the economic benefits to communities and stakeholder groups would not be as great as under the other alternatives.

Economic Environment

Employment/Income

Under the No Action Alternative, invasive plant populations would likely continue to spread, possibly at increasing rates, without use of fuels reduction treatments. Related declines in native habitat, combined with the potential for the spread of invasive plants from public lands to private lands would adversely affect social and economic communities and would thus be detrimental to local economies.

The No Action Alternative would not provide employment and income effects directly, however if a wildland fire would occur and spread due to the infestation of the invasive weeds, there may be an increase in the work needed for fighting the fire. There may also be some loss of jobs and income while the wildland fire was burning as well as post fire if access to treated areas was restricted for rehabilitation of vegetation. In such an event, it is possible that closures would last longer, particularly in areas with relatively poor soils. If long-term closures occurred over large acreages and conflicted with recreation areas, they could result in job losses and associated reductions in income. Employment and income losses would have the greatest effect on smaller communities, where alternative employment opportunities would be scarce, and where these losses would represent a larger portion of the economy than they would near larger, more diversified towns and cities.

Effects on Private Property

The No Action Alternative could affect private property in the vicinity of public lands, particularly parcels adjacent to RRCNCA. Invasive plants would continue to flourish, propagate, and drift onto adjacent private property.

Over the short and long terms, an increase of invasive plants in RRCNCA increases the risk of wildland fire in RRCNCA and to adjacent property owners.

An increase of invasive plants increases the risks of noxious weeds spreading onto neighboring parcels. An increase in such risks could lead to decreased property values over the long term.

Revenues Generated by BLM Land

Casual use and commercial activities that occur on public lands could be affected by the No Action Alternative. By not removing invasive plants from specific areas within RRCNCA, it increase the risk of wildland fires. If a wildland fire occurs in RRCNCA without a fuel break, there would be a greater firefighter and public safety risk while controlling the fire. Temporary or long-term closures of popular recreation sites may occur, either to protect public safety during the wildland fire event or to decrease user-related impacts during the wildland fire's post-treatment recovery. This would result in temporary or long-term losses of revenues to surrounding businesses.

Recreation activities within RRCNCA would continue, but would shift to other locations that are open. Depending on the location of the alternate use area, the economic benefits would shift from one community to another. If there were a suitable nearby alternative to the closed site, the effects on the surrounding businesses would be minimal; if not, the businesses would be adversely affected for a period of time.

Increased hazardous fuels and increased risk of wildland fires could adversely impact the economies of communities and stakeholders, which are often dependent on recreational and wilderness values. In some cases, severe wildfires, particularly those occurring during the tourist season, could cause long-term disruption to recreation values, which would adversely affect recreational businesses.

Expenditures by the BLM

Wildland Fire Management

It is likely that fire suppression costs and fire damage losses would be greater under the No Action Alternative than under the other alternative.

4.1.12. Soils

4.1.12.1. Proposed Action

The Proposed Action will help prevent future erosion of the project area, by reducing the size and intensity of a wildfire. Following fire a water repellent layer may form on top of the soil if suitable conditions exist such as soil type and excessive heat. The water repellent layer acts as a barrier to water infiltration during rain events and contributes to increased runoff and soil erosion.

4.1.12.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) will help prevent future erosion of the project area, by reducing the size and intensity of a wildfire while leaving some vegetative material on the surface to reduce the effects of erosion. Following fire a water repellent layer may form on top of the soil if suitable conditions exist such as soil type and excessive heat. The water repellent layer acts as a barrier to water infiltration during rain events and contributes to increased runoff and soil erosion.

4.1.12.3. Alternative C (Mechanical Blading)

Water erodibility of the soil in the area is classified as slight, moderate, severe, or very severe. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion control measures are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion control measures are costly and generally impractical [U. S. Department of Agriculture (USDA)-Natural Resource Conservation Service (NRCS) 2006]. Alternative C (Mechanical Blading) would result in a “severe” rating, whereas an additional wildfire in the project area — under the No Action Alternative— would result in a “severe” or a “very severe” rating.

The disturbance associated with Alternative C (Mechanical Blading) will increase erosion on and off-site, thereby increasing sediment loads in surface runoff, altering the discharge and retention rates of water and change the velocity of water moving through the system. This could result in the degradation of surface water quality, as well as flow events exceeding the capacity of constructed detention basins.

4.1.12.4. No Action Alternative

Water erodibility of the soil in the area is classified as slight, moderate, severe, or very severe. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion control measures are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion control measures are costly and generally impractical (USDA-NRCS 2006). Alternative C (Mechanical Blading) would result in a “severe” rating, whereas an

additional wildfire in the project area — under the No Action Alternative— would result in a "severe" or a "very severe" rating.

The disturbance associated with wildfire [or Alternative C (Mechanical Blading) to a lesser extent] will increase erosion on and off-site, thereby increasing sediment loads in surface runoff, altering the discharge and retention rates of water and change the velocity of water moving through the system. This could result in the degradation of surface water quality, as well as flow events exceeding the capacity of constructed detention basins.

4.1.13. Threatened, Endangered or Candidate Species

4.1.13.1. Proposed Action

This project would affect a total of 4,460 acres of desert tortoise habitat. Since tortoise sign has been found in the vicinity and undisturbed habitat exists in the area, there is potential for tortoises to wander into the project area. If not noticed and avoided, desert tortoises could be either injured or killed (by crushing) or harassed (by being moved out of harm's way) by vehicle activities during the Proposed Action.

Section 7 Consultation for the Proposed Action is covered under the Biological Opinion (BO) for the Herbicide Fuels Treatment Project in RRCNCA (File No. 84320-2012-F-00020, 1-5-04-F-526APD). Additional impacts to desert tortoise and desert tortoise habitat are discussed in the above mentioned BO. Minimization measures in the above BO contain measures to reduce potential impacts to desert tortoise.

4.1.13.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) would affect a total of 2,114 acres of desert tortoise habitat. Since tortoise sign has been found in the vicinity and undisturbed habitat exists in the area, there is potential for tortoises to wander into the project area. If not noticed and avoided during Alternative B (Mechanical Mowing), desert tortoises could be either injured or killed (by crushing) or harassed (by being moved out of harm's way). Alternative B (Mechanical Mowing) would require formal consultation with the USFWS and must be appended to the RRCNCA Programmatic BO (File No. 1-5-04-F-526).

4.1.13.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) would affect a total of 2,114 acres of desert tortoise habitat. Since tortoise sign has been found in the vicinity and undisturbed habitat exists in the area, there is potential for tortoises to wander into the project area. If not noticed and avoided during Alternative C (Mechanical Blading), desert tortoises could be either injured or killed (by crushing) or harassed (by being moved out of harm's way). Alternative C (Mechanical Blading) would require formal consultation with the USFWS and must be appended to the RRCNCA Programmatic BO (File No. 1-5-04-F-526).

4.1.13.4. No Action Alternative

The No Action Alternative would not incur immediate harmful effects toward wildlife. However, there is a potential for more wildlife habitat including desert tortoise habitat to burn if these fuel

breaks were not installed. Fire in a Mojave Desert plant community reduces the availability of native shrubs for desert tortoise habitat and forage, replacing shrubs with low utility annual non-native grasses (Brooks and Esque 2002).

4.1.14. Vegetation Excluding Federally Listed Species

4.1.14.1. Proposed Action

The Proposed Action would prevent or limit the germination and establishment of targeted non-native annual grasses. The use of herbicides also has the potential to limit the germination and establishment of non-target annual and perennial plant species including cactus, yucca and Joshua trees (*Yucca brevifolia*). In the short term, native annual forbs that create wildflower displays would be the most affected. When compared to untreated areas the most likely visible result would be an increase in bare soil visible between shrubs, and an absence or a decrease in native wildflower displays in treatment areas. In the long term, recurrent herbicide treatments would likely prevent or limit the natural replacement of shrubs. The visible result would be a decrease in the number of shrubs present within treatment areas and an increase in the amount of bare ground within the treatment areas. The reduction in vegetation cover associated with herbicide treatments would lead to decreased soil stability and a higher potential for soil erosion.

Herbicides can affect the growth and survivorship of individual plants. Cactus and yucca in particular are known to be sensitive to herbicide treatments. Cactus, yucca, and perennial shrubs (including creosote, white bursage, blackbrush and other species) within treatment areas may be killed because of accidental herbicide applications and/or herbicide drift. The likely visible result would be increased bare ground and occasional standing dead plants within treatment areas.

The creation of fuel breaks with herbicides would create bare ground adjacent to roads and trails. Roads and trails are known to be key locations for the establishment of new weed populations. Periodic fuel break monitoring would detect incipient weed populations and direct targeted treatment to prevent establishment.

4.1.14.2. Alternative B (Mechanical Mowing)

The creation of fuel breaks using a Dixie harrow or other mechanical mowing equipment would reduce all native and non-native vegetation cover to 2 inches in height. In general, Alternative B (Mechanical Mowing) would likely cause mortality of most native shrubs, cactus and yucca within treatment areas. In the short term, Alternative B (Mechanical Mowing) would leave roots and soil structure intact to provide soil stability. The removal of biomass through Alternative B (Mechanical Mowing) would reduce the ability of remaining shrubs in treated areas to produce seed and recover from fire or other disturbance. Over the long term, repeated treatments of Alternative B (Mechanical Mowing) would likely lead to the loss of all perennial shrub cover in the treatment areas. In general, mowing at two inches in height would likely favor the establishment of non-native Mediterranean grass (*Schismus sp.*) and other low-growing, disturbance adapted species. In the long term, Mediterranean grass and other low-growing native and non-native species would likely stabilize soils within the treatment areas.

4.1.14.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) fuel breaks using a bulldozer or grader would result in the removal of all native and non-native vegetation cover. In the short term, the removal of vegetation cover and disturbance to the soil surface would reduce soil stability and lead to erosion. The removal of all biomass would reduce the ability of treatment areas to recover from fire and other disturbance.

4.1.14.4. No Action Alternative

Under the No Action Alternative no treatments would be implemented. No direct impacts to vegetation would occur. Periodic wildfires would be expected to occur. Based on fire history in RRCNCA, the wildfire return interval in untreated areas is estimated to be approximately 20 years at any given location.

4.1.15. Visual Resources

4.1.15.1. Proposed Action

Since RRCNCA is primarily visited for its scenic quality, the level of sensitivity to contrast in visual resource values is high. Many visitors come to RRCNCA in the spring season to see wildflowers. Pre-emergent herbicide is expected to affect annual plant and wildflower bloom in the treated area for the duration of the treatment. Post-emergent herbicide would also affect native annual plants but is not expected to harm perennial shrubs.

Contrast Analysis Ratings from all five KOPs showed an overall weak level of contrast with the surrounding landscape. Landform and structures would not be affected by the Proposed Action. Vegetation would have weak levels of contrast in the elements of form, line, and texture. The lack of native annuals would create a moderate level of visual contrast with the characteristic landscape in the element of color for the period of time that treatments are occurring since herbicide application may prevent annual wildflower bloom. Some visitors may be affected by this if they are specifically looking for wildflowers. However, wildflowers may still be found in other locations within RRCNCA. After treatments are complete, the Proposed Action is expected to improve visual resources by reducing nonnative vegetation and the risk of wildfire damage and scars. A contrast rating of weak meets the VRM objectives for VRM Class II.

4.1.15.2. Alternative B (Mechanical Mowing)

The contrast in the foreground for each of the five KOPs rated moderate to strong. By implementing Alternative B (Mechanical Mowing) and mowing all vegetation (both annual and perennial) in the treatment area, strong levels of contrast are created in the elements of texture, form, and color. The naturally shrubby and coarse texture of vegetation would be replaced by a stubble covered soil surface. The range of colors comprising the vegetation community would be removed. Alternative B (Mechanical Mowing) would not meet Visual Resource Management objectives for class II.

4.1.15.3. Alternative C (Mechanical Blading)

The contrast in the foreground for each of the five KOPs rated moderate to strong. By implementing Alternative C (Mechanical Blading) and removing all vegetation (both annual and perennial) in the treatment area, strong levels of contrast would be created in the elements of texture, form, and color. The naturally shrubby and coarse texture of vegetation would be replaced by smooth soil surface. The range of colors comprising the vegetation community would be removed. Alternative C (Mechanical Blading) would not meet VRM objectives for class II.

4.1.15.4. No Action Alternative

There would be no immediate direct effects on Visual Resources under the No Action Alternative. However the indirect effects, increased populations of brome potentially leading to catastrophic wildfire throughout RRCNCA, would not meet the specific goals and objectives of the LUP for RRCNCA. Under the LUP, RRCNCA is designated VRM Class II which is an outstanding scenic quality, high viewer sensitivity, and high visibility. This would degrade the existing character of the landscape, replacing the existing elements of form, line, color, and texture found in the landscape with a fire-altered landscape.

4.1.16. Wetland/Riparian

4.1.16.1. Proposed Action

Potential direct and indirect effects of the Proposed Action were not significant enough to necessitate further analysis of Wetland/Riparian resources.

4.1.16.2. Alternative B (Mechanical Mowing)

Potential direct and indirect effects of Alternative B (Mechanical Mowing) were not significant enough to necessitate further analysis of Wetland/Riparian resources.

4.1.16.3. Alternative C (Mechanical Blading)

Potential direct and indirect effects of Alternative C (Mechanical Blading) were not significant enough to necessitate further analysis of Wetland/Riparian resources.

4.1.16.4. No Action Alternative

The greatest threat to wetlands/riparian zones in the project area stems from wildfires, which are more likely under the No Action Alternative. Wildfires have the potential to completely denude these sensitive areas.

4.1.17. Wild Horses/Burros

4.1.17.1. Proposed Action

The Proposed Action includes two different herbicide treatments, Plateau® and/or Journey®. Based on the Plateau® specimen label and MSDS (BASF 2010a) there should be no impacts to the foraging wild burros in the HMA if they were to ingest any treated vegetation as long as the herbicide label restrictions and recommended application rates are followed. Based on the Journey® specimen label and MSDS (BASF 2010b) there are no grazing restrictions. There should be no impacts to the foraging wild burros in the HMA if they were to ingest any of the treated vegetation as long as the herbicide label restrictions and recommended application rates are followed.

4.1.17.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) would reduce all vegetation to a 2" stubble height. While this would not completely remove the forage it would reduce the total forage available to wild horses and burros in the treatment area.

4.1.17.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) would completely remove all vegetation including the native forage wild horses and burros depend on to survive in the Red Rock HMA.

4.1.17.4. No Action Alternative

Wildfires may be more likely to occur if the non-native vegetation is allowed to spread and continue growing. Wildfires have the potential to greatly impact wild horses and burros. Wildfires can remove large areas of forage, damage water systems, impacts springs, and potentially trap and kill wild horses and burros, if they are not able to escape the wildfires. Also, the increase in non-native vegetation can potentially affect the areas and the amount of native forage available to wild horses and burros for foraging.

4.1.18. Wilderness

4.1.18.1. Proposed Action

The Proposed Action is not located within or adjacent to Wilderness Study Areas (WSA) or Instant Study Areas (ISA); it is located adjacent to Rainbow Mountain Wilderness and La Madre Mountain Wilderness within which motorized vehicles and mechanized equipment are prohibited. The Proposed Action would be limited to existing access roads/trails and natural features outside of these wilderness areas. No buffer zones are created around wilderness to protect them from the influence of activities on adjacent land. Although the Proposed Action may be seen or heard by recreationists within small portions of the wilderness areas, the activity would be temporary in nature and would not impact access to the areas. The areas would continue to appear to be affected primarily by the forces of nature.

4.1.18.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) is not located within or adjacent to WSAs or ISAs; it is located adjacent to Rainbow Mountain Wilderness and La Madre Mountain Wilderness within which motorized vehicles and mechanized equipment are prohibited. Alternative B (Mechanical Mowing) would be limited to existing access roads/trails and natural features outside of these wilderness areas and no buffer zones are created around wilderness to protect them from the influence of activities on adjacent land. Although mowing may be seen or heard by recreational users within small portions of the wilderness areas, the activity is temporary in nature and will not impact access to the areas. The areas will continue to appear to be affected primarily by the forces of nature.

4.1.18.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) would not be located within or adjacent to WSAs or ISAs; it would be located adjacent to Rainbow Mountain Wilderness and La Madre Mountain Wilderness within which motorized vehicles and mechanized equipment are prohibited. Alternative C (Mechanical Blading) would be limited to existing access roads/trails and natural features outside of these wilderness areas. No buffer zones are created around wilderness as protection from the influence of adjacent land activities. Although blading may be seen or heard by recreationists within small portions of the wilderness areas, the action would be temporary in nature and would not impact access to the areas. The areas would continue to appear to be affected primarily by the forces of nature.

4.1.18.4. No Action Alternative

The No Action Alternative would not result in any indirect impacts to recreational use within wilderness. With no buffer zones around wilderness to provide protection from the influence of activities on adjacent land, the continued persistence of brome infestations adjacent to Wilderness diminishes the ability of BLM to control, contain, or eliminate certain grasses within these areas and prevent an “annual grass/fire cycle” which could further harm the native vegetation and therefore decrease the natural character within Wilderness. Recreational use beginning in RRCNCA and spanning into Wilderness may contribute to the spread of brome into Wilderness. Noxious and non-native invasive weeds are frequent obstacles to managing for the preservation of wilderness character.

4.1.19. Wildlife Excluding Federally Listed Species

4.1.19.1. Proposed Action

Wildlife species in the general area include small mammals, birds and reptiles. Impacts to these species include the potential for increased mortality due to an increase in vehicular traffic.

The herbicide Imazapic is of low toxicity to birds and mammals. According to the manufacturer, imazapic does not bio-accumulate in animals as it is rapidly excreted in urine and feces. Imazapic is therefore, essentially non-toxic to a wide range of non-target organisms, including mammals, birds, fish, aquatic invertebrates, and insects (Tu et al. 2001). This herbicide has not been tested

on reptiles. There is a current study underway testing this chemical on reptiles, but no results have been published. Additionally, Glyphosate is of relatively low toxicity to birds, mammals, and fish.

Wildlife species in the general area are common and widely distributed and the loss of some individuals and/or their habitat would have a negligible impact on populations of the species throughout the region.

Also the long term benefits associated with the Proposed Action, such as a reduction in fine fuels, are beneficial to wildlife. The fuel breaks have the potential to reduce the size and intensity of wildfires in the area, thereby protecting more suitable habitat than is lost due to the Proposed Action.

4.1.19.2. Alternative B (Mechanical Mowing)

Wildlife species in the general area include small mammals, birds and reptiles. Initially wildlife species would be displaced by machinery, noises, and other disturbances creating more competition for resources in the adjacent lands. As the species move out of the Project area to avoid Alternative B (Mechanical Mowing) they have the potential to be injured or killed by vehicular traffic. Also in the case that wildlife species are unable to move out of the way, Alternative B (Mechanical Mowing) could result in injuring or killing local species. Species that would be most sensitive to disturbance and most likely targeted by these activities would include ground-dwelling animals and less mobile species.

Alternative B (Mechanical Mowing) would not only remove non-native species but also native species that have the potential to provide foraging habitat, nest sites and cover for wildlife species. The reduction in cover may result in increased predation, as animals are increasingly exposed to predators in their search for cover.

Additional impacts associated with the mortality from vehicular traffic, because animals are moving out of harms way into adjacent areas may also occur. Foraging and cover habitat would be altered, and this could cause wildlife to be displaced.

The long term impacts of Alternative B (Mechanical Mowing) may include soil compaction by heavy machinery, which may impede the return of native vegetation. A decrease in native vegetation would impact wildlife by decreasing forage, and cover. The compaction may also have an effect on burrowing species such as snakes and small mammals that rely on permeable soils for burrows or burrowing owls that rely on other animals burrows.

Alternative B (Mechanical Mowing) does not provide a disposal location for the remaining mowed material upon completion of mowing. If material is left in place it may impact wildlife species by to smothering and killing ground vegetation and decreasing vegetative growth.

4.1.19.3. Alternative C (Mechanical Blading)

Wildlife species in the general area include small mammals, birds, and reptiles. The noise created by Alternative C (Mechanical Blading) and associated with the use of heavy machinery would affect wildlife by increasing dispersal of local species throughout the project area creating more competition for resources in the adjacent lands. In the event that wildlife species were unable to move out of the way of blading machinery, the primary direct impact of Alternative C (Mechanical Blading) would be injuring or killing local species. Species that would be most sensitive to

disturbance and most likely targeted by these activities would include ground-dwelling animals and less mobile species.

Alternative C (Mechanical Blading) would be scheduled for the fall and winter months during hibernation periods for reptiles and other animals. If the animals are hibernating none of them will be able to move out of the way of the blade. The use of a grader, bulldozer, and/or bobcat may impact the soil and has the potential to disturb the top layer of vegetation and in some cases the soil, in turn effecting burrowing species.

Alternative C (Mechanical Blading) would remove non-native and native species that provide suitable habitat for small mammals, birds, and reptiles. This disturbance would result in a reduction in forage, nesting material, and cover and wildlife would be displaced. The reduction in cover could result in increased predation, as animals are increasingly exposed to predators in their search for cover.

Other impacts may include soil compaction by heavy machinery, which may impede the return of native vegetation. This activity would also result in a decrease in native vegetation and decrease forage, and cover. The compaction may also have an effect on burrowing species such as snakes and small mammals that rely on permeable soils for burrows or burrowing owls that rely on other animals burrows.

Alternative C (Mechanical Blading) does not provide a disposal location for the remaining graded material upon completion of blading. If material is left in place it may impact wildlife species by to smothering and killing ground vegetation and decreasing vegetative growth.

4.1.19.4. No Action Alternative

Under the No Action Alternative, there would be no direct harmful effects toward wildlife.

Should a wildfire occur at the RRCNCA, with no fuel breaks there is potential for additional wildlife habitat including desert tortoise habitat to burn. As a result of fire disturbance and the slow desert plant community recovery following large scale fire events, non-native and annual grass competition could increase and fill in more inter-spaces throughout the RRCNCA. The habitat conversion from native species to non-native annual grasses is unlikely to support wildlife populations that are dependant upon native plants for food and shelter.

In addition to localized impacts on wildlife, habitat outside of the NCA may be burned and there is the potential for an overall decrease in suitable habitat.

4.2. Cumulative Effects

The CEQ regulations implementing NEPA define cumulative impacts as "…[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions (RFFA) regardless of what agency (Federal or Non-Federal) or person undertakes such actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The RRCNCA cumulative impact assessment area consists of the RRCNCA which is approximately 196,000 acres of which 194,443 acres are BLM managed public lands, 529 acres owned by Nevada State, and 2,992 acres are private lands. Las Vegas is situated to the east of the cumulative impact analysis area which encompasses the communities of Blue Diamond and

Calico Basin as well as Spring Mountain State Park and the private commercial resort of Bonnie Springs Old Nevada. (see map 9.1: Cumulative Effects Area).

Past, Present, and Reasonably Foreseeable Future Actions

On the basis of agency records, Geographic Information System analysis and interdisciplinary team discussion the following past, present and RFFA, which have impacted or may impact the affected resources within the assessment area to varying degrees, have been identified:

Table 4.1. Past, Present and Reasonably Foreseeable Future Actions.

Factor	Action	Description	Area Affected
Past Planning	RRCNCA RMP and ROD (2005)	RMP describes the appropriate uses and development of the conservation area as it provides management guidance and identifies land use decision to be implemented for management.	198,000 acres of public lands in the NCA in Clark County.
Past Planning	Regional Open Space Plan (Approved 2006).	Provides goals for conserving open space to provide connectivity to RRCNCA.	Las Vegas metropolitan area and RRCNCA.
Past Planning	Las Vegas Valley Perimeter Open Space Plan (Approved 2009).	Provides goals for conserving open space to provide connectivity to RRCNCA.	Las Vegas metropolitan area and RRCNCA.
Current Planning	Transportation Feasibility Study	Analysis of current Core Area transportation infrastructure (Scenic Drive, trails, trailheads, and parking) to find solutions to current transportation concerns and potential future issues due to increased visitor use.	The core area of the RRCNCA including the scenic drive, adjacent facilities, and transportation infrastructure.
Current Planning	RRCNCA RMP Amendment — Bolting in Wilderness	Analysis of the current bolting restrictions in RRCNCA wilderness to find solutions for safe climbing.	La Madre Mountain and Rainbow Mountain Wilderness areas approximately 27,879 acres and 20,311 acres (respectively) of which are located within RRCNCA. .
Current Planning	La Madre Mountain and Rainbow Mountain Wilderness Management Plan	Provides general management direction for areas adjacent to the planning area.	La Madre Mountain and Rainbow Mountain Wilderness areas approximately 27,879 acres and 20,311 acres (respectively) of which are located within RRCNCA.
Future Planning	Transportation and Travel Management Plan	Analysis, defining, and designating currrent and future roads, trails, signage, and information systems within the RRCNCA.	198,000 acres of public lands in the NCA in Clark County.

Factor	Action	Description	Area Affected
Past Project	Red Rock Scenic Drive Trail System (1995)	A 13–mile one-way paved road and 46 miles of paved and unpaved trails.	Located within the Core Area, the Red Rock Scenic Drive for visitors to drive, bike or hike. The remaining miles of trail system provides a network of access to other areas within the Core Area and beyond. The Red Rock Scenic Drive Trail System is used for casual recreation use as well as for permitted activities. The system of trails continues to be maintained today.
Past Project	Cottonwood Valley Trail System (1996)	Approximately 60 miles of trails in the Cottonwood Valley area.	Located adjacent to the Core Area, the Cottonwood Valley Trail System provides a network of access to areas north of the Core Area. It is used for casual recreation use as well as for permitted activities. The system of trails continues to be maintained today.
Past Project	Emergency fire control of wildland fires	Fires have ranged from 0.1-1600+ acres within the assessment area. More than half of the area within the Scenic Drive has burned within the last seven years, affecting visitor safety and experience.	Located in various areas throughout the RRCNCA, primarily occurring in shrub communities in the Core area.
Past Project	Post-fire Emergency Stabilization and Rehabilitation (ES&R)	ES&R treatments including soil stabilization measures, native seeding, weed control, and planting of native species on various fires, including the Scenic and Loop Fires, (ranging from 60-1600+ acres) within the assessment area. More than half of the area within the Scenic Drive has burned within the last seven years.	Located in various areas within the RRCNCA, primarily occurring in shrub communities in the Core area.

Factor	Action	Description	Area Affected
Past Project	Visitor Center (April 2010)	Construction of a new Visitor Center, Amphitheater and outdoor interpretive space. Old visitor center converted to BLM office facility.	Located within the Core Area, the newly constructed Visitor Center provides additional indoor and outdoor space for viewing and educational interpretation for enhanced visitor experience. The additional BLM office space created by the conversion of the former visitor center, allows for more staff work space enabling for enhanced on-site support for RRCNCA. It is anticipated that visitation may increase as a result of the new infrastructure and additional staff support.
Past Project	State Route 159 Corridor Trail Feasibility Study and Programmatic Environmental Assessment (PEA) (2010)	The PEA analyzed a network of trails intended to enhance connections from municipalities and the county into Red Rock Canyon. Inter-connectivity to trails in other municipalities and federal lands. The Zone 2 Trail is consistent with the planned systems trails that would make connections to non-motorized trails outside the NCA. In addition, the Zone 2 Trail would connect to widely used existing on-road bicycle undesignated routes.	Planning for this project included consultation with trail planners from Clark County to accomplish these means. This proposed trail alignment is intended to connect nodes within RRCNCA, including both ends of the Scenic Drive. In the next phase of design, the proposed trail segments will add connections to the campground, Spring Mountain Ranch State Park, and Bonnie Springs.
Past Project	Red Rock Fire Station weed control (2011).	Weed and hazardous fuel treatment.	Treatment area was within the fenced fire station area. Protected the fire station from fire through removal of hazardous fuel. Treated State listed noxious weed and invasive annual grasses using a combination of herbicide (Journey®) and manual treatment.
Current Project	Search and Rescue Training	Las Vegas Metropolitan Police Dept. Search and Rescue (SAR) Training. Pilot and crew training by helicopter within Wilderness areas.	Locations in Rainbow Mountain Wilderness and La Madre Mountain Wilderness. Prepares SAR and emergency personnel for backcountry operations in response to an emergency situation. Provides direct training on SAR for missing or injured members of the public.

Factor	Action	Description	Area Affected
Current Project	SRPs for the Cottonwood Valley Trail System	EA analyzing a number of SRPs for issuance over a given period of time within the Cottonwood Valley Trail System of RRCNCA. This would be done by identifying and clarifying areas approved for multiple recreation uses to meet current and future SRP annual needs for an approximate five-year period (2012–2017).	Located adjacent to the Core Area, the Cottonwood Valley Trail System provides a network of access to areas north of the Core Area with various casual recreation use and permitted activities occurring there regularly.
Current Project	Wastewater system upgrade to RRCNCA Visitor Center	RRCNCA Visitor Center upgrade of septic system.	RRCNCA Visitor Center is located within the Core Area. Improvements to the wastewater system would accommodate the increased use and address human health and safety.
Current Project	Upgrades to Red Rock Fire Station	Facility improvements include: ● Upgrade of septic system; ● Installation of a well ● Installation of communication system. ● Installation of parking lot solar panels ● Installation of asphalt pavement	Red Rock Fire Station is located in the Core Area and improvements to the facility would accommodate use and address health and safety for on-site staff support who provide for protection of resources.
Current Project	Upgrades to existing Moenkopi Campground	Campground improvements include installation of: ● Campsite parking stalls and parking lot; ● Well; ● Shade structures; ● Solar panels for electricity to the site; ● Concrete pads for picnic tables; and ● One double vault toilet.	Campground is located in the Core Area and improvements to the facility would result in improved visitor experience and potential increase in use.

Factor	Action	Description	Area Affected
Current Project	Red Rock Hazardous Fuels Reduction Project	Treatment using herbicide, mowing, blading or combination of these methods to remove invasive/noxious weeds and to create fuel breaks.	Fuels reduction treatments in and around the Core Area of RRCNCA would treat invasive/noxious weeds adjacent to roads, trails and in previously burned areas in order to create fuel breaks and limit potential fire spread in the event of a wildland fire. Native plant species would be avoided.
Future Project	State Route 159 Multi-Use Trail — Zone 2	The 3.1–mile Zone 2 Trail roughly parallels State Route 159 on the western side and extends from the from the RRCNCA Visitor Center to the Scenic Drive Exit Lot.	Located within the Core Area, the Zone 2 Trail is one segment of the five segment State Route 159 Corridor Trail intended to connect to trails in other municipalities and federal lands. With the EA completed in early 2012, the Zone 2 project is shelf-ready and pending funding for construction. This hiking/biking/equestrian riding trail would provide access into RRCNCA for casual recreation users as well as for permitted activities. It is anticipated that visitation may increase as a result of the completion of the trail.
Future Project	Designation of trails in the Blue Diamond Mesa/Cowboy Trails area.	Trails to be used for hiking, mountain biking, and equestrian use.	Blue Diamond Mesa/Cowboy Trails area.

4.2.1. Air Quality

4.2.1.1. Proposed Action

The aforementioned past, present and RFFA are located in or adjacent to the Core Area of RRCNCA where air quality was declared a Class II classification by the state of Nevada, which allows moderate deterioration associated with moderate, well controlled industrial and population growth.

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to concentrate visitor use to designated areas to reduce impacts to air quality. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use as well as to provide support for resource staff. The future trail system would provide additional designated recreation space and connectivity for visitors.

As the projects are completed, increase in visitor use may occur as a result of these infrastructure and resource improvements. Increased use may lead to increased impacts to air quality.

The existing, improved, or new trails, trailheads, roads and parking areas would promote recreation use to stay on the trails and built areas, potentially reducing trail widening, trail braiding and social trails from being created, thus reducing impacts to air quality. Facility upgrades and new infrastructure would promote concentrated use to designated areas, such as the picnic and pit toilet areas at the campgrounds and trailheads.

BLM data shows that multiple fires have occurred within the assessment area. Within the last seven years 6 wildfires have burned within the assessment area. The wildfires have ranged in size from 60 acres to 1600+ acres. Approximately 2,469 acres have burned within the Scenic Drive (over half of the acres within the Scenic Drive) affecting air quality. Some of the affected areas have been subjected to stabilization and rehabilitation treatments. It is anticipated that wildfire ignitions would increase in the future based on current climate conditions and increased use of the public lands negatively affecting air quality.

With the management guidance and land use decisions in the 2005 RRCNCA RMP and ROD, protective management directions are in place for air quality. As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the need for areas to recreate increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas, thus reducing impacts to air quality.

Overall, the Proposed Action with the aforementioned activities would likely result in minor adverse cumulative effects on air quality in the short term, and beneficial cumulative effects on air quality in the long term.

4.2.1.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing) cumulative impacts to air quality has the potential to impact air quality by increasing carbon and particulate emissions from heavy equipment, however, increases in emissions associated with these activities would be temporary in nature and negligible. All other cumulative impacts to air quality would be the same as the Proposed Action.

4.2.1.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading) cumulative impacts to air quality has the potential to impact air quality by increasing carbon and particulate emissions from heavy equipment, however, increases in emissions associated with these activities would be temporary in nature and negligible. All other cumulative impacts to air quality would be the same as the Proposed Action.

4.2.1.4. No Action Alternative

With the No Action Alternative cumulative impacts to air quality has the potential to impact air quality by increasing carbon and particulate emissions from a catastrophic wildfire.

Within the last seven years 6 wildfires have burned within the assessment area. The wildfires have ranged in size from 60 acres to 1600+ acres. Approximately 2,469 acres have burned within the Scenic Drive (over half of the acres within the Scenic Drive) affecting air quality. It is anticipated that wildfire ignitions would increase in the future based on current climate conditions and increased use of the public lands negatively affecting air quality.

All other cumulative impacts to air quality would be the same as the Proposed Action.

4.2.2. BLM Sensitive Plant Species

4.2.2.1. Proposed Action

The aforementioned past, present and RFFA are located in or adjacent to the Core Area of RRCNCA where BLM Sensitive Plant Species are present. BLM Sensitive Plant Species habitat could be disturbed during construction periods and post construction visitor use. Recreation may increase as a result of bringing more people into the project area, including hiking, biking and camping. Any increase in human activities in the project area would increase the potential for degradation of habitat, spread of weeds, and increase in the risks of wildfires.

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to concentrate visitor use to designated areas to reduce impacts to BLM Sensitive Plant Species. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use as well as to provide support for resource staff. The future trail system would provide additional designated recreation space and connectivity for visitors.

As the projects are completed, increase in visitor use may occur as a result of these infrastructure and resource improvements. Increased use may lead to increased impacts to BLM Sensitive Plant Species.

The existing, improved, or new trails, trailheads, roads and parking areas would promote recreation use to stay on the trails and built areas, potentially reducing trail widening, trail braiding and social trails from being created, thus reducing impacts to BLM Sensitive Plant Species. Facility upgrades and new infrastructure would promote concentrated use to designated areas, such as the picnic and pit toilet areas at the campgrounds and trailheads.

BLM data shows that multiple fires have occurred within the assessment area. Within the last seven years 6 wildfires have burned within the assessment area. The wildfires have ranged in size from 60 acres to 1600+ acres. Approximately 2,469 acres have burned within the Scenic Drive (over half of the acres within the Scenic Drive) affecting BLM Sensitive Plant Species. Some of the affected areas have been subjected to stabilization and rehabilitation treatments. It is anticipated that wildfire ignitions would increase in the future based on current climate conditions and increased use of the public lands negatively affecting BLM Sensitive Plant Species.

As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the need for areas to recreate increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas, thus reducing impacts to BLM Sensitive Plant Species.

Overall, the Proposed Action with the aforementioned activities would likely result in minor adverse cumulative effects on BLM Sensitive Plant Species in the short term, and beneficial cumulative effects on BLM Sensitive Plant Species in the long term.

4.2.2.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing) potential cumulative impacts to BLM Sensitive Plant Species would be direct mortality of individual plants or degradation of habitat. All other cumulative impacts to BLM Sensitive Plant Species would be the same as the Proposed Action.

4.2.2.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading) potential cumulative impacts to BLM Sensitive Plant Species would be direct mortality of individual plants or degradation of habitat. All other cumulative impacts to BLM Sensitive Plant Species would be the same as the Proposed Action.

4.2.2.4. No Action Alternative

With the No Action Alternative potential cumulative impacts to BLM Sensitive Plant Species would be direct mortality of individual plants or degradation of habitat by catastrophic wildfire. All other cumulative impacts to BLM Sensitive Plant Species would be the same as the Proposed Action.

4.2.3. BLM Sensitive Wildlife Species

4.2.3.1. Proposed Action

The aforementioned past, present and RFFA are located in or adjacent to the Core Area of RRCNCA where BLM Sensitive Wildlife Species include large mammals, bats, birds, reptiles and invertebrates. These species could be displaced, injured or killed if lands are disturbed during construction periods and post construction visitor use.

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to concentrate visitor use to designated areas to reduce impacts to wildlife and habitat. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use as well as to provide support for resource staff. The future trail system would provide additional designated recreation space and connectivity for visitors.

As the projects are completed, increase in visitor use may occur as a result of these infrastructure and resource improvements. Increased use may lead to increased visitor-wildlife interactions, which could result in animal displacement, harassment or mortality.

The existing, improved, or new trails, trailheads, roads and parking areas would promote recreation use to stay on the trails and built areas, potentially reducing trail widening, trail braiding and social trails from being created, thus reducing impacts to wildlife habitat. Facility upgrades and new infrastructure would promote concentrated use to designated areas, such as the picnic and pit toilet areas at the campgrounds and trailheads.

BLM data shows that multiple fires have occurred within the assessment area. Within the last seven years 6 wildfires have burned within the assessment area. The wildfires have ranged in size from 60 acres to 1600+ acres. Approximately 2,469 acres have burned within the Scenic Drive (over half of the acres within the Scenic Drive) affecting wildlife. Some of the affected areas

have been subjected to stabilization and rehabilitation treatments. It is anticipated that wildfire ignitions would increase in the future based on current climate conditions and increased use of the public lands negatively affecting wildlife.

The reduction of invasive/noxious weeds from the fuels reduction project would be beneficial to wildlife habitat as it would reduce competition for vegetation and habitat fragmentation. Additionally, the fuel breaks created would increase the survivability of wildlife and their habitat in the potential event of a wildland fire.

With the management guidance and land use decisions in the 2005 RRCNCA RMP and ROD, protective management directions are in place for wildlife and habitat. As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the need for areas to recreate increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas, thus reducing impacts to wildlife and their habitat.

Overall, the Proposed Action with the aforementioned activities would likely result in minor adverse cumulative effects on wildlife species in the short term, and beneficial cumulative effects on wildlife in the long term.

4.2.3.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to BLM Sensitive Wildlife Species would be the same as the Proposed Action.

4.2.3.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading), cumulative impacts to BLM Sensitive Wildlife Species would be the same as the Proposed Action.

4.2.3.4. No Action Alternative

Cumulative impacts to the landscape are limited to the current situation, and are not expected to increase or decrease appreciably with no new disturbance authorized. If this project was not completed there would be no cumulative effects from the activities associated with the Proposed Action, and Alternatives B and C. However, in the event that the No Action Alternative is selected, there is the potential for many more thousands of acres wildlife habitat to burn from wildfires. Wildlife would be impacted by the emergency suppression measures implemented to protect human safety and property combined with other RRCNCA projects having indirect impacts on wildlife habitat.

4.2.4. Floodplains

4.2.4.1. Proposed Action

The aforementioned past, present, and RFFA in the project area are not expected to create significant cumulative impacts on floodplains.

4.2.4.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to floodplains would be the same as the Proposed Action.

4.2.4.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) in conjunction with past, present, and RFFA in the project area, would change hydrologic patterns to elicit cumulative effects. These alterations would initiate the following cumulative effects in the watershed: 1) changes in sediment transport; 2) alteration of discharge and retention rates of water; 3) changes in velocity of water moving through the system. All other cumulative impacts to floodplains would be the same as the Proposed Action.

4.2.4.4. No Action Alternative

Under the No Action Alternative any significant storms could result in flooding hazards that would cause significant damage across the Proposed Project area and could potentially cause significant localized destruction, especially following a vegetation consuming wildfire. Wildfire is likely to change or alter the accuracy of surface water modeling on alluvial fans and increase the associated flood hazards. Catastrophic flooding could occur during precipitation events following a wildfire in the project area. All other cumulative impacts to floodplains would be the same as the Proposed Action.

4.2.5. Fuels/Fire Management

4.2.5.1. Proposed Action

The aforementioned past, present and RFFA are located in or adjacent to the Core Area of RRCNCA where 6 wildfires have burned over the last seven years. The wildfires have ranged in size from 60 acres to 1600+ acres. Approximately 2,469 acres have burned within the Scenic Drive (over half of the acres within the Scenic Drive) affecting the safety and visitor experience of the public. Some of the affected areas have been subjected to stabilization and rehabilitation treatments. It is anticipated that wildfire ignitions would increase in the future based on current climate conditions and increased use of the public lands. These wildfires pose a threat during construction periods and post construction visitor use.

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to concentrate visitor use to designated areas. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use as well as to provide support for resource staff. The future trail system would provide additional designated recreation space and connectivity for visitors.

As the projects are completed, increase in visitor use may occur as a result of these infrastructure and resource improvements. Increased use leads to a greater concern for visitor safety in the event of a wildfire.

As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the need for areas to recreate increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas, thus increasing visitor safety if a wildfire should occur.

Cumulative effects from past wildfires have increased the abundance and seed bank of non-native invasive annual grasses in these burn scars and converted them into invasive annual grass mono-cultures further increasing the wildfire risk in these areas. This has increased the wildfire hazard in these previously burned areas but also serves as a seed source for expansion of invasive annual grasses to other areas of RRCNCA. It could be surmised that construction of the Scenic Drive, Cottonwood Valley Trail System and State Route 159 bike trail could enhance fire protection by serving as fuel breaks but this has not been the case in four of the previous fires in RRCNCA. The other past actions have a negligible cumulative effect on fuels/fire management except for the construction of the visitor center which serves as a value to be protected from wildfire. The effects from past, present, and RFFA combined with the Proposed Action would reduce the size of wildfires. Wildlife habitat and RRCNCA infrastructure would be better protected and previously burned areas would be treated aiding the rehabilitation to native plant wildlife habitat and reducing the spread of invasive annual grass seeds to other areas of RRCNCA.

Overall, the Proposed Action with the aforementioned activities would likely result in beneficial cumulative effects to fuels/fire management and in the long term they would provide increased visitor safety and enhanced recreation experience.

4.2.5.2. Alternative B (Mechanical Mowing)

Cumulative effects from past wildfires has increased the abundance and seed bank of non-native invasive annual grasses in these burn scars. This has increased the wildfire hazard in these previously burned areas but also serves as a seed source for expansion of invasive annual grasses to other areas of RRCNCA. It could be surmised that construction of the Scenic Drive, Cottonwood Valley Trail System and State Route 159 bike trail could enhance fire protection by serving as fuel breaks but this has not been the case in four of the previous wildfires in RRCNCA. The other past actions have a negligible cumulative effect on fuels/fire management except for the construction of the visitor center which serves as a value to be protected from wildfire. The effects from past, present, and RFFA combined with Alternative B (Mechanical Mowing) would reduce the size of wildfires. Wildlife habitat and RRCNCA infrastructure would be better protected; however, previously burned areas would not be treated reducing the likelihood of rehabilitating these areas to native plant wildlife habitat and eliminating the opportunity to curtail the spread of invasive annual grass seeds to other areas of RRCNCA. All other cumulative impacts to fuels/fire management would be the same as the Proposed Action.

4.2.5.3. Alternative C (Mechanical Blading)

Cumulative effects from past wildfires has increased the abundance and seed bank of non-native invasive annual grasses in these burn scars. This has increased the wildfire hazard in these previously burned areas but also serves as a seed source for expansion of invasive annual grasses to other areas of RRCNCA. It could be surmised that construction of the Scenic Drive, Cottonwood Valley Trail System and State Route 159 bike trail could enhance fire protection by

serving as fuel breaks but this has not been the case in four of the previous wildfires in RRCNCA. The other past actions have a negligible cumulative effect on fuels/fire management except for the construction of the visitor center which serves as a value to be protected from wildfire. The effects from past, present, and RFFA combined with Alternative C (Mechanical Blading) would reduce the size of wildfires. Wildlife habitat and RRCNCA infrastructure would be better protected; however, previously burned areas would not be treated reducing the likelihood of rehabilitating these areas to native plant wildlife habitat and eliminating the opportunity to curtail the spread of invasive annual grass seeds to other areas of RRCNCA. All other cumulative impacts to fuels/fire management would be the same as the Proposed Action.

4.2.5.4. No Action Alternative

Cumulative effects of the No Action Alternative would include the potential for wildfires to burn larger areas. Wildlife habitat and RRCNCA infrastructure would not be better protected, and previously burned areas would not be treated reducing the likelihood of rehabilitating these areas to native plant wildlife habitat and eliminating the opportunity to curtail the spread of invasive annual grass seeds to other areas of RRCNCA. All other cumulative impacts to fuels/fire management would be the same as the Proposed Action.

4.2.6. Human Health and Safety

4.2.6.1. Proposed Action

The aforementioned past, present, and RFFA are intended to provide outdoor recreational experiences for the public while protecting resources.

Designated trails, trailheads, roads, parking areas, facilities and infrastructure would provide defined areas for the public to recreate, bathrooms, and travel which meet federal, state, and local guidelines for health and safety.

Facility improvement and trail construction projects will also insure health and safety aspects for the visiting public by providing safe drinking water, waste disposal, and travel by-ways as the projects are completed.

The proposed fuels reduction treatment will result in a reduction in the potential for catastrophic fire events which could result in health and safety issues for staff, the general public and both public and private property.

With the management guidance and land use decisions in the 2005 RRCNCA RMP and ROD, protective management directions are in place for public health and safety. As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the need for areas to recreate increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas, thus providing safely maintained access to the public with better and more accurate signage, mapping, and related information.

Wildfires in the past along roadways and near structures have posed public safety threats by reducing visibility from smoke and exposing people to smoke. Past wildfires in RRCNCA have necessitated the evacuation of public buildings and the closing of the Scenic Drive and State

Route 159 for safety of the public and government employees. In addition, past wildfires have exhibited high rates of spread (i.e. jumping State Route 159) putting firefighters at risk. It is anticipated that past, present and RFFA when combined with the Proposed Action would improve safety to the public along highways and to residents in the area. Wildfires would still occur within the assessment area however fire size and intensity would decrease due to efforts to construct fuel breaks. More recreation use would create additional impacts from human uses including increased potential for injuries; however, the State Route 159 bike trail will decrease the likelihood of a motor vehicle striking a bicyclist.

Overall, the Proposed Action with the aforementioned activities would likely result in beneficial cumulative effects to human health in the long term as they would provide increased recreation opportunities and enhanced recreation experience.

4.2.6.2. Alternative B (Mechanical Mowing)

Wildfires in the past along roadways and near structures have posed public safety threats by reducing visibility from smoke and exposing people to smoke. Past wildfires in RRCNCA have necessitated the evacuation of public buildings and the closing of the Scenic Drive and State Route 159 for safety of the public and government employees. In addition, past wildfires have exhibited high rates of spread (i.e. jumping State Route 159) putting firefighters at risk. It is anticipated that past, present and RFFA when combined with Alternative B (Mechanical Mowing) would improve safety to the public along highways and to residents in the area. Wildfires would still occur within the assessment area however fire size and intensity would decrease due to efforts to construct fuel breaks. More recreation use would create additional impacts from human uses including increased potential for injuries; however, the State Route 159 bike trail will decrease the likelihood of a motor vehicle striking a bicyclist. All other cumulative impacts to human health and safety would be the same as the Proposed Action.

4.2.6.3. Alternative C (Mechanical Blading)

Wildfires in the past along roadways and near structures have posed public safety threats by reducing visibility from smoke and exposing people to smoke. Past wildfires in RRCNCA have necessitated the evacuation of public buildings and the closing of the Scenic Drive and State Route 159 for safety of the public and government employees. In addition, past fires have exhibited high rates of spread (i.e. jumping State Route 159) putting firefighters at risk. It is anticipated that past, present and RFFA when combined with Alternative C (Mechanical Blading) would improve safety to the public along highways and to residents in the area. Wildfires would still occur within the assessment area however fire size and intensity would decrease due to efforts to construct fuel breaks. More recreation use would create additional impacts from human uses including increased potential for injuries; however, the State Route 159 bike trail will decrease the likelihood of a motor vehicle striking a bicyclist. All other cumulative impacts to human health and safety would be the same as the Proposed Action.

4.2.6.4. No Action Alternative

Cumulative effects of the No Action Alternative would include potential for wildfires to burn larger areas. Fuel breaks providing public safety would occur on a case-by-case basis and treatments would occur over a longer period of time. All other cumulative impacts to human health and safety would be the same as the Proposed Action.

4.2.7. Hydrologic Conditions (Including Water Quality)

4.2.7.1. Proposed Action

The aforementioned past, present, and RFFA in the project area are not expected to create significant cumulative impacts on hydrologic conditions (Including Water Quality).

4.2.7.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to hydrologic conditions (Including Water Quality) would be the same as the Proposed Action.

4.2.7.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) in conjunction with past, present, and RFFA in the project area, would change hydrologic patterns to elicit cumulative effects. These alterations would initiate the following cumulative effects in the watershed: 1) changes in sediment transport; 2) alteration of discharge and retention rates of water; 3) changes in velocity of water moving through the system. This could result in the degradation of surface water quality, as well as flow events exceeding the capacity of constructed detention basins. All other cumulative impacts to hydrologic conditions (Including Water Quality) would be the same as the Proposed Action.

4.2.7.4. No Action Alternative

Under the No Action Alternative any significant storms could result in flooding hazards that would cause significant damage across the Proposed Project area and could potentially cause significant localized destruction, especially following a vegetation consuming wildfire. Wildfire is likely to change or alter the accuracy of surface water modeling on alluvial fans and increase the associated flood hazards. Catastrophic flooding could occur during precipitation events following a wildfire in the project area. This could result in the degradation of surface water quality, as well as flow events exceeding the capacity of constructed detention basins. All other cumulative impacts to hydrologic conditions (Including Water Quality) would be the same as the Proposed Action.

4.2.8. Invasive Species/Noxious Weeds

4.2.8.1. Proposed Action

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to provide access and recreational opportunities for visitors. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use as well as to provide support for resource staff. The future trail system would provide additional designated recreation space and connectivity for visitors.

Facility improvement and trail construction projects may increase visitor use as a result of these infrastructure and resource improvements. The existing, improved, or new trails, trailheads, roads and parking areas would promote recreation use to stay on the trails and built areas, potentially reducing trail widening, trail braiding and social trails from being created. The trail construction

would enable a greater range of access and connectivity to other trails and areas within the RRCNCA and may help to disperse recreation use in the Core Area and throughout the RRCNCA and provide vectors for invasive species/noxious weeds to spread.

As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the need for areas to recreate increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas and may help to alleviate congestion not only in transportation in the Core Area, but may also disperse recreation use in the Core Area and throughout the RRCNCA possibly aiding the spread of invasive species/noxious weeds. In a study of spotted knapweed, seeds remained on vehicles even after traveling 10 miles from an infestation (Trunkle and Fay, 2010). Likewise, weed infestations encountered during a visit to RRCNCA are liable to be transported throughout the region.

Indirect impacts of the Proposed Action would be a possible reduction in the extent of wildfire, which in turn would reduce the spread potential of invasive non-native species following wildfire.

The Proposed Action would reduce the negative effects of disturbance associated with past, present and RFFA trail way and roadway improvements, by reducing the abundance of weed species. Many of the documented weed species, such as mustards and thistles, are susceptible to the proposed herbicide formulations, and may be controlled along with the target grasses. The Proposed Action could reduce additional fine fuels originating from other annual plant species in addition to the target brome species.

Overall, the Proposed Action with the aforementioned activities would likely result in minor adverse cumulative effects on invasive species/noxious weeds in the short term, and beneficial cumulative effects to invasive species/noxious weeds in the long term as they would provide increased invasive species/noxious weeds control adjacent to infrastructure and along trails and roads.

4.2.8.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) in conjunction with impacts from the disturbance associated with previous, present and foreseeable future construction of corridors (Scenic Drive, hiking trails) would ultimately result in an increased fuel source and larger extent and density of flammable annual weeds in future years. There are documented weed species at nearly every pull-off and overlook along the Scenic Drive and along many of the hiking trails proposed to receive mowing treatments. It is expected that the ongoing disturbance associated with mowing plant material to 2 inches of height, along with the physical dispersal mowing would facilitate by spreading plant material and soil, would reduce native perennial competition, ultimately providing non-native annual species a competitive advantage and increasing the spatial extent of weeds along the entire Proposed Project area. Since RRCNCA experiences heavy visitor use, it is expected that the increase of weeds in RRCNCA would ultimately expand the extent of weeds throughout the region as visitors disperse soil and vegetation during their travels. All other cumulative impacts to invasive species/noxious weeds would be the same as the Proposed Action.

4.2.8.3. Alternative C (Mechanical Blading)

The previously established Scenic Drive and trail ways throughout the Proposed Project area support weed populations. In conjunction with Alternative C (Mechanical Blading), weed plant material and seed would be spread throughout the project area, together increasing the extent and density of weed populations. Since RRCNCA experiences heavy visitor use, it is expected that the increase of weeds in RRCNCA would ultimately expand the extent of weeds throughout the region as visitors disperse soil and vegetation during their travels. All other cumulative impacts to invasive species/noxious weeds would be the same as the Proposed Action.

4.2.8.4. No Action Alternative

If the Proposed Action does not occur, the density of weed populations throughout the project area are likely to increase. In the event of catastrophic wildfire, it is likely that perennial native species would burn more intensely than the invasive grasses in the inter-spaces, reversing the typically greater seedbank below shrubs to a greater interspace seedbank. In result, additional catastrophic wildfire would be expected. After a 2005 burn at RRCNCA the native perennial cover typical of blackbrush shrub habitat was replaced by a perennial forb community which offered seven times less native cover than the pre-fire plant community (Abella et al. 2009). All other cumulative impacts to invasive species/noxious weeds would be the same as the Proposed Action.

4.2.9. Migratory Birds

4.2.9.1. Proposed Action

The aforementioned past, present and RFFA are located in or adjacent to the Core Area of RRCNCA where migratory birds are present. These species could be displaced, injured or killed if lands are disturbed during construction periods and post construction visitor use. Recreation may increase as a result of bringing more people into the project area, including hiking, biking and camping. Any increase in human activities in the project area would increase the potential for take of migratory birds through intentional or unintentional killing, degradation of habitat, spread of weeds, and increase in the risks of wildfires.

The cumulative effects of the aforementioned activities would be the same as those described in the BLM Sensitive Wildlife Species section for the Proposed Action.

4.2.9.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing) cumulative impacts would not result as actions would occur outside of bird breeding season. All other cumulative impacts to migratory birds would be the same as the Proposed Action.

4.2.9.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading) cumulative impacts would not result as actions would occur outside of bird breeding season. All other cumulative impacts to migratory birds would be the same as the Proposed Action.

4.2.9.4. No Action Alternative

Under the No Action Alternative the cumulative impacts to the landscape are limited to the current situation, and are not expected to increase or decrease appreciably with no new disturbance authorized. If this project was not completed there would be no cumulative effects from the activities associated with the Proposed Action, and Alternatives B and C. However, in the event that the No Action Alternative is selected, there is a higher potential for catastrophic wildfire to burn migratory bird habitat. All other cumulative impacts to migratory birds would be the same as the Proposed Action.

4.2.10. Recreation

4.2.10.1. Proposed Action

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to provide access and recreational opportunities for visitors. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use as well as to provide support for resource staff. The future trail system would provide additional designated recreation space and connectivity for visitors.

Facility improvement and trail construction projects may create a temporary inconvenience for recreation users where areas may be restricted during construction periods. However, once completed, the facility improvements would provide infrastructure and upgrade amenities for the public and resource staff and would promote concentrated use to designated areas, such as the picnic and pit toilet areas at the campgrounds and trailheads.

As the projects are completed, increase in visitor use may occur as a result of these infrastructure and resource improvements. The existing, improved, or new trails, trailheads, roads and parking areas would promote recreation use to stay on the trails and built areas, potentially reducing trail widening, trail braiding and social trails from being created. The trail construction would enable a greater range of access and connectivity to other trails and areas within the RRCNCA and may help to disperse recreation use in the Core Area and throughout the RRCNCA.

There may be a temporary inconvenience for recreation users where areas may be restricted during the fuels reduction treatment. This could include road or trail closures for short 1–3 day interim periods; however, the Veteran's, Thanksgiving and Christmas holiday weekends would remain open as no treatments would occur during these high visitor use times. Areas adjacent to the fuels reduction treatment where recreation may occur, may decrease the opportunity for solitude on the trail when the treatment creates noise. Once completed, the fuel breaks created would increase the safety factor for recreation users in the potential event of a wildland fire.

The 2005 RRCNCA RMP and ROD provides management guidance and land use decisions for recreation to occur while protecting resources. As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the need for areas to recreate increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas and may help to alleviate congestion not only

in transportation in the Core Area, but may also disperse recreation use in the Core Area and throughout the RRCNCA.

Within the last seven years 6 wildfires have burned within the assessment area. The wildfires have ranged in size from 60 acres to 1600+ acres. Approximately 2,469 acres have burned within the Scenic Drive (over half of the acres within the Scenic Drive) affecting the safety and recreation experience of the public by causing emergency evacuations and closures of the Scenic Drive and State Route 159 closing RRCNCA to recreationists and tourists. It is anticipated that wildfire ignitions would increase in the future based on current climate conditions and increased use of the public lands possibly causing future emergency closures of the RRCNCA.

Overall, the Proposed Action with the aforementioned activities would likely result in minor adverse cumulative effects on recreation in the short term, and beneficial cumulative effects to recreation in the long term as they would provide increased recreation opportunities and enhanced recreation experience.

4.2.10.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to recreation would be the same as in the Proposed Action.

4.2.10.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading), cumulative impacts to recreation would be the same as in the Proposed Action.

4.2.10.4. No Action Alternative

With the No Action Alternative, cumulative impacts to recreation would be the same as in the Proposed Action.

4.2.11. Socio-Economics

4.2.11.1. Proposed Action

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to provide access and recreational opportunities for visitors. These developments also aid with permitted events and activities. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use as well as to provide support for resource staff. The future trail system would provide additional designated recreation space and connectivity for visitors and permitted events. These developments would add to the viability of the local economy.

Facility improvement and trail construction projects may create a temporary inconvenience for recreation users and permitted activities where areas may be restricted during construction periods. However, once completed, the facility improvements would provide infrastructure and upgrade amenities for the public and resource staff and would promote concentrated use to designated areas, such as the picnic and pit toilet areas at the campgrounds and trailheads and provide efficient and economically viable options for current and future users.

As the projects are completed, increase in visitor use may occur as a result of these infrastructure and resource improvements. The existing, improved, or new trails, trailheads, roads and parking areas would promote recreation use to stay on the trails and built areas, potentially reducing trail widening, trail braiding and social trails from being created. The trail construction would enable a greater range of access and connectivity to other trails and areas within the RRCNCA and may help to disperse recreation use including permitted use and activities in the Core Area and throughout the RRCNCA.

There may be a temporary inconvenience for recreation users and permitted groups where areas may be restricted during the fuels reduction treatment. This could include road or trail closures for short 1–3 day interim periods. Areas adjacent to the fuels reduction treatment where recreation may occur, may decrease the opportunity for solitude on the trail when the treatment creates noise. Once completed, the fuel breaks created would increase the safety factor for recreation users and SRP holders in the potential event of a wildland fire.

The 2005 RRCNCA RMP and ROD provides management guidance and land use decisions for recreation to occur while protecting resources. As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the requests for areas to recreate and provide business opportunities increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel, transportation and permitted SRP and event use to designated areas and may help to alleviate congestion not only in the transportation Core Area, but may also disperse recreation use in the Core Area and throughout the RRCNCA.

The Proposed Action creates fuelbreaks to protect the natural wonders of RRCNCA. As the population in the Las Vegas valley continues to increase, and as the popularity of RRCNCA increases, the need for nature-based outdoor recreation areas will continue to be in demand. While the increased use could be beneficial for social and economic welfare, care is needed to minimize any potential impacts to the natural and cultural resources.

The contribution of the Proposed Action when combined with the aforementioned past, present, and RFFA would result in beneficial cumulative effects to the Core Area of the RRCNCA by providing an organized trail system, a desirable amenity that contributes to the economic vitality of the community. Additional benefits as a result of the past, present, and RFFA help to support the local and regional economies of southern Nevada by providing employment and generating revenue from outdoor recreation, the travel and service industries, and associated retail sales.

4.2.11.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to socio—economics would be the same as in the Proposed Action.

4.2.11.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading), cumulative impacts to socio—economics would be the same as in the Proposed Action.

4.2.11.4. No Action Alternative

With the No Action Alternative, cumulative impacts to socio—economics would be the same as in the Proposed Action.

4.2.12. Soils

4.2.12.1. Proposed Action

The aforementioned past, present, and RFFA in the project area are not expected to create significant cumulative impacts on soils.

4.2.12.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to soils would be the same as in the Proposed Action.

4.2.12.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading), would result in a "severe" water erodibility rating. The disturbance associated with Mechanical Blading, and to a lesser extent compared to a wildfire, would increase erosion on and off-site, thereby increasing sediment loads in surface runoff, altering the discharge and retention rates of water and changing the velocity of water moving through the system. This could result in the degradation of surface water quality, as well as flow events exceeding the capacity of constructed detention basins. All other cumulative impacts to soils would be the same as the Proposed Action.

4.2.12.4. No Action Alternative

The No Action Alternative would result in a "severe" or a "very severe" rating. The disturbance associated with wildfire, would increase erosion on and off-site, thereby increasing sediment loads in surface runoff, altering the discharge and retention rates of water and changing the velocity of water moving through the system. This could result in the degradation of surface water quality, as well as flow events exceeding the capacity of constructed detention basins. All other cumulative impacts to soils would be the same as the Proposed Action.

4.2.13. Threatened, Endangered or Candidate Species

4.2.13.1. Proposed Action

The aforementioned past, present and RFFA are located in or adjacent to the Core Area of RRCNCA where desert tortoise are present. These species could be displaced, injured or killed if lands are disturbed during construction periods and post construction visitor use. Recreation may increase as a result of bringing more people into the project area, including hiking, biking and camping. Any increase in human activities in the project area would increase the potential for take of desert tortoise and/or sensitive species through intentional or unintentional killing,

degradation of habitat, spread of weeds, and increase in the risks of wildfires, vandalism, trash dumping, and poaching.

The cumulative effects of the aforementioned activities would be the same as those described in the BLM Sensitive Wildlife Species section for the Proposed Action.

4.2.13.2. Alternative B (Mechanical Mowing)

Alternative B (Mechanical Mowing) would affect a total of 2,114 acres of desert tortoise habitat. Since desert tortoise sign has been found in the vicinity and undisturbed habitat exists in the area, there is potential for tortoises to wander into the project area. If not noticed and avoided during construction, desert tortoises could be either injured or killed (by crushing) or harassed (by being moved out of harm's way). All other cumulative impacts to threatened, endangered or candidate species would be the same as the Proposed Action.

4.2.13.3. Alternative C (Mechanical Blading)

Alternative C (Mechanical Blading) would affect a total of 2,114 acres of desert tortoise habitat. Since desert tortoise sign has been found in the vicinity and undisturbed habitat exists in the area, there is potential for desert tortoises to wander into the project area. If not noticed and avoided during Mechanical Blading, desert tortoises could be either injured or killed (by crushing) or harassed (by being moved out of harm's way). All other cumulative impacts to threatened, endangered or candidate species would be the same as the Proposed Action.

4.2.13.4. No Action Alternative

Under the No Action Alternative the cumulative impacts to the landscape are limited to the current situation, and are not expected to increase or decrease appreciably with no new disturbance authorized. If this project was not completed there would be no cumulative effects from the activities associated with the Proposed Action, and Alternatives B and C. However, in the event that the No Action Alternative is selected, there is a higher potential for catastrophic wildfire to burn desert tortoise habitat. All other cumulative impacts to threatened, endangered or candidate species would be the same as the Proposed Action.

4.2.14. Vegetation Excluding Federally Listed Species

4.2.14.1. Proposed Action

The cumulative effects of the aforementioned past, present, and RFFA would be the same as those described in the BLM Sensitive Plant Species section for the Proposed Action.

4.2.14.2. Alternative B (Mechanical Mowing)

The cumulative effects of the aforementioned past, present, and RFFA would be the same as those described in the BLM Sensitive Plant Species section for Alternative B (Mechanical Mowing).

4.2.14.3. Alternative C (Mechanical Blading)

The cumulative effects of the aforementioned past, present, and RFFA would be the same as those described in the BLM Sensitive Plant Species section for Alternative C (Mechanical Blading).

4.2.14.4. No Action Alternative

The cumulative effects of the aforementioned past, present, and RFFA would be the same as those described in the BLM Sensitive Plant Species section for the No Action Alternative.

4.2.15. Visual Resources

4.2.15.1. Proposed Action

The aforementioned past, present and RFFA are located in or adjacent to the Core Area of RRCNCA which is largely comprised of VRM Class II, designated as such for its outstanding scenic quality, high viewer sensitivity, and high visibility. There are also small portions of Class III and Class IV within the project area. Any roads, trails, parking lots or transportation infrastructure would be built following VRM Class II guidelines that would keep a low natural profile and maintain the natural beauty of RRCNCA.

4.2.15.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to visual resources would be the same as the Proposed Action.

4.2.15.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading), cumulative impacts to visual resources would be the same as the Proposed Action.

4.2.15.4. No Action Alternative

Under the No Action Alternative, the project would not directly affect visual resources. However, the potential for wildfires would increase as a result of the No Action Alternative. Resulting fires would ultimately leave a landscape typically composed of creosote-bursage/blackbrush plant structure marred by scars composed of a mono-typic community of brome devoid of the native species characteristic of the Mojave Desert. New scars in conjunction with 3,038 acres of existing fire scars within RRCNCA would significantly impact the visual values of the area. All other cumulative impacts to visual resources would be the same as the Proposed Action.

4.2.16. Wetlands/Riparian

4.2.16.1. Proposed Action

The aforementioned past, present, and RFFA in the project area are not expected to create significant cumulative impacts on Wetlands/Riparian resources.

4.2.16.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to wetlands/riparian would be the same as the Proposed Action.

4.2.16.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading), cumulative impacts to wetlands/riparian would be the same as the Proposed Action.

4.2.16.4. No Action Alternative

Under the No Action Alternative, there is a threat to wetlands/riparian resources in the project area from wildfires. This combined with previous fires, and other past, present and RFFA at RRCNCA has the potential to negatively impact these sensitive areas. All other cumulative impacts to wetlands/riparian resources would be the same as the Proposed Action.

4.2.17. Wild Horses/Burros

4.2.17.1. Proposed Action

The reduction of invasive/noxious weeds from the fuels reduction project would be beneficial in reducing non-native vegetation competition with native forage. Additionally, the fuel breaks would increase the survivability of the wild horse and burro populations and protect the Red Rock HMA in the potential event of a wildland fire.

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to provide access and recreational opportunities for visitors. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use as well as to provide support for resource staff. The future trail system would provide additional designated recreation space and connectivity for visitors. This development could lead to more visitation to the Red Rock HMA.

Facility improvement and trail construction projects may create a temporary disturbance for wild horse and burros where areas may be restricted during construction periods. As the projects are completed, increase in visitor use may occur as a result of these infrastructure and resource improvements. Increased use may lead to increased visitor-wild horse and burro interactions, which could result in animal harassment (feed, pet, chase, bait, lure, etc.).

The existing, improved, or new trails, trailheads, roads and parking areas would promote recreation use to stay on the trails and built areas, potentially reducing trail widening, trail braiding and social trails from being created. Facility upgrades and new infrastructure would promote concentrated use to designated areas, such as the picnic and pit toilet areas at the campgrounds and trailheads. These may result in reducing impacts to vegetation and suitable forage.

The 2005 RRCNCA RMP and ROD provides management guidance and land use decisions for recreation to occur while protecting resources. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future

visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas and may help to alleviate disturbances to the wild horse and burro population not only in transportation in the Core Area, but may also disperse recreation use in the Core Area and throughout the RRCNCA.

Overall, the Proposed Action with the aforementioned activities would likely result in minor adverse cumulative effects on wild horses and burros in the short term, and beneficial cumulative effects on wild horses and burros in the long term.

4.2.17.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to wild horses and burros would be the same as the Proposed Action.

4.2.17.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading), cumulative impacts to wild horses and burros would be the same as the Proposed Action.

4.2.17.4. No Action Alternative

Under the No Action Alternative, if the fuel reduction treatments were not completed there is the potential to lose many acres of forage and habitat in the Red Rock HMA due to wildfires. All other cumulative impacts to wild horses and burros would be the same as the Proposed Action.

4.2.18. Wilderness

4.2.18.1. Proposed Action

The reduction of invasive/noxious weeds from the fuels reduction project would be beneficial to the adjacent Wilderness Areas as it would reduce competition for vegetation and habitat fragmentation by non-native species. Additionally, the fuel breaks created would increase the viability of the adjacent wilderness conditions in the potential event of a wildland fire.

While none of the aforementioned past, present and RFFA occur within the wilderness, the facilities may attract additional visitor use to RRCNCA and potentially incidental casual use into the Wilderness Areas.

Designated trails, trailheads, roads, parking areas, facilities and infrastructure were developed to provide access and recreational opportunities for visitors. Current facility and infrastructure improvements at the Visitor Center, Red Rock Fire Station and Moenkopi Campground would upgrade amenities and systems in order to meet the increased visitor use in centralized areas outside of wilderness while providing information about wilderness, wilderness ethics, and education regarding the use of wilderness. The future trail system would provide additional designated recreation space and connectivity for visitors. This development could lead to more visitation to Wilderness Areas. However these improvements would also concentrate the visitation to defined areas which should lead to less fragmentation by user created trails.

Facility improvement and trail construction projects, while not located in Wilderness Areas, would provide opportunities to prepare for wilderness experiences. The facility improvements would provide infrastructure and upgrade amenities for the public and resource staff and would promote concentrated use to designated areas outside of the wilderness, such as the picnic and pit toilet areas at the campgrounds and trailheads.

Helicopter and commercial airlines would continue to use the airspace above the wilderness, impacting solitude. Las Vegas Metropolitan Police Department Search and Rescue training would continue to occur on a limited basis within the wilderness.

The 2005 RRCNCA RMP and ROD provides management guidance and land use decisions for recreation to occur while protecting resources. As growth in the Las Vegas Valley continues to grow, and as the popularity of the RRCNCA increases, the need for areas to provide for solitude and the interaction with nature increases each year and will continue to increase in the future. The Transportation Feasibility Study and subsequent Travel and Transportation Management Plan would address current and future visitation conditions and provide implementation level management directions to concentrate travel and transportation use to designated areas and may help to alleviate disturbance to the Wilderness areas. Wilderness planning underway may address group size issues and other concerns which may require additional stipulations and/or changes to current and future SRPs.

The BLM Red Rock/Sloan Field Office is initiating an amendment to the RRCNCA RMP and ROD regarding allowing new bolts in designated wilderness. This proposal would somewhat reduce self-reliant recreation by allowing individuals to utilize permanent fixed anchors rather than removable hardware, and increase solitude by establishment of new routes with bolts, and decrease the noise created from drilling.

Overall, the Proposed Action with the aforementioned activities would likely result in minor adverse cumulative effects on wilderness in the short term, and beneficial cumulative effects on wilderness in the long term.

4.2.18.2. Alternative B (Mechanical Mowing)

With Alternative B (Mechanical Mowing), cumulative impacts to wilderness would be the same as the Proposed Action.

4.2.18.3. Alternative C (Mechanical Blading)

With Alternative C (Mechanical Blading), cumulative impacts to wilderness would be the same as the Proposed Action.

4.2.18.4. No Action Alternative

The No Action Alternative could result in conditions that cause catastrophic fire. The loss of habitat, scenic values, and trails/routes could impact the wilderness area by increasing visitor use in areas designated as wilderness. All other cumulative impacts to wilderness would be the same as the Proposed Action.

4.2.19. Wildlife Excluding Federally Listed Species

4.2.19.1. Proposed Action

The cumulative effects of the aforementioned past, present, and RFFA would be the same as those described in the BLM Sensitive Wildlife Species section for the Proposed Action.

4.2.19.2. Alternative B (Mechanical Mowing)

The cumulative effects of the aforementioned past, present, and RFFA would be the same as those described in the BLM Sensitive Wildlife Species section for Alternative B (Mechanical Mowing).

4.2.19.3. Alternative C (Mechanical Blading)

The cumulative effects of the aforementioned past, present, and RFFA would be the same as those described in the BLM Sensitive Wildlife Species section for Alternative C (Mechanical Blading).

4.2.19.4. No Action Alternative

The cumulative effects of the aforementioned activities would be the same as those described in the BLM Sensitive Wildlife Species section for the No Action Alternative.

4.3. Mitigation/Residual Effects

4.3.1. Air Quality

4.3.1.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.1.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.1.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.1.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative. See Appendix D for avoidance measures and BMPs.

4.3.2. BLM Sensitive Plant Species

4.3.2.1. Proposed Action

Yellow Two-tone Beardtongue (*Penstemon bicolor ssp. bicolor*)

- Prior to the Proposed Action and prior to all follow-up treatments all potential yellow two-tone beardtongue habitat will be surveyed. Pre-activity surveys will be completed by a qualified botanist using the BLM rare plant survey protocol. The surveys will be reviewed and accepted by the SNDO Botanist prior to initiating the activity.
- No treatments will be conducted within 200 feet of yellow two-tone beardtongue individuals and sites where the species has been previously recorded.
- BLM would collect seed from populations at risk and the project would sponsor the addition of the yellow two-tone beardtongue to the Center for Plant Conservation (CPC) imperiled plant collection. As part of this sponsorship, the seed would be held in long-term conservation storage and a small annual stipend would be provided by the CPC in perpetuity to a member botanic garden for basic research on the species. This research would provide urgently needed information regarding the species life history, pollinator relationships, conservation genetics, and horticultural propagation. The one time sponsorship would cost approximately $15,000

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Blue Diamond Cholla (*Cylindropuntia whipplei var. multigeniculata*)

- Aerial herbicide BMPs would reduce the likelihood of herbicide drift and are addressed in Appendix D and theSOPs For Herbicide Application in Appendix B.
- Post application monitoring of plant mortality would be used to identify where herbicide drift has occurred outside of treatment areas and, if necessary, adjust application techniques prior to application near any populations.

4.3.2.2. Alternative B (Mechanical Mowing)

Yellow Two-tone Beardtongue (*Penstemon bicolor ssp. bicolor*)

- Prior to initial mowing and prior to all follow-up treatments all potential yellow two-tone beardtongue habitat will be surveyed. Pre-activity surveys will be completed by a qualified botanist using the BLM rare plant survey protocol. The surveys will be reviewed and accepted by the SNDO Botanist prior to initiating the activity.
- No treatments will be conducted within 200 feet of yellow two-tone beardtongue plants and sites where the species has been previously recorded.
- BLM would collect seed from populations at risk and the project would sponsor the addition of the yellow two-tone beardtongue to the CPC imperiled plant collection. As part of this sponsorship, the seed would be held in long-term conservation storage and a small annual stipend would be provided by the CPC in perpetuity to a member botanic garden for basic research on the species. This research would provide urgently needed information regarding the species life history, pollinator relationships, conservation genetics, and horticultural propagation. The one time sponsorship would cost approximately $15,000.

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4.3.2.3. Alternative C (Mechanical Blading)

Yellow Two-tone Beardtongue (*Penstemon bicolor ssp. bicolor*)

- Prior to initial blading and prior to all follow-up treatments all potential yellow two-tone beardtongue habitat will be surveyed. Pre-activity surveys will be completed by a qualified botanist using the BLM rare plant survey protocol. The surveys will be reviewed and accepted by the SNDO Botanist prior to initiating the activity.
- No treatments will be conducted within 200 feet of yellow two-tone beardtongue plants and sites where the species has been previously recorded.
- BLM would collect seed from populations at risk and the project would sponsor the addition of the yellow two-tone beardtongue to the CPC imperiled plant collection. As part of this sponsorship, the seed would be held in long-term conservation storage and a small annual stipend would be provided by the CPC in perpetuity to a member botanic garden for basic research on the species. This research would provide urgently needed information regarding the species life history, pollinator relationships, conservation genetics, and horticultural propagation. The one time sponsorship would cost approximately $15,000

4.3.2.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.3. BLM Sensitive Wildlife Species

4.3.3.1. Proposed Action

A quarter mile buffer will be upheld around all springs in the project area. See Appendix D for avoidance measures and BMPs. Additional avoidance measures are outlined in the SOPs For Herbicide Application in Appendix B.

4.3.3.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.3.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.3.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.4. Floodplains

4.3.4.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.4.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.4.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.4.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.5. Fuels/Fire Management

4.3.5.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.5.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.5.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.5.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.6. Human Health and Safety

4.3.6.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.6.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.6.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.6.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.7. Hydrologic Conditions (Including Water Quality)

4.3.7.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.7.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.7.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.7.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.8. Invasive Species/Noxious Weeds

4.3.8.1. Proposed Action

SOPs For Herbicide Application are included in Appendix B.

4.3.8.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.8.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.8.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.9. Migratory Birds

4.3.9.1. Proposed Action

- To prevent undue harm, habitat-altering projects or portions of projects should be scheduled outside bird breeding season. In upland desert habitats and ephemeral washes containing upland species, the season generally occurs between March 15th - July 30th.
- If a project that may alter any breeding habitat must occur during the breeding season, then a qualified biologist must survey the area for nests prior to commencement of treatment activities. This shall include burrowing and ground nesting species in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriately-sized buffer area must be avoided until the young birds fledge.

4.3.9.2. Alternative B (Mechanical Mowing)

- To prevent undue harm, habitat-altering projects or portions of projects should be scheduled outside bird breeding season. In upland desert habitats and ephemeral washes containing upland species, the season generally occurs between March 15th - July 30th.
- If a project that may alter any breeding habitat has to occur during the breeding season, then a qualified biologist must survey the area for nests prior to commencement of treatment activities. This shall include burrowing and ground nesting species in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriately-sized buffer area must be avoided until the young birds fledge.

4.3.9.3. Alternative C (Mechanical Blading)

- To prevent undue harm, habitat-altering projects or portions of projects should be scheduled outside bird breeding season. In upland desert habitats and ephemeral washes containing upland species, the season generally occurs between March 15th - July 30th.
- If a project that may alter any breeding habitat has to occur during the breeding season, then a qualified biologist must survey the area for nests prior to commencement of treatment activities. This shall include burrowing and ground nesting species in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriately-sized buffer area must be avoided until the young birds fledge.

4.3.9.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.10. Recreation

4.3.10.1. Proposed Action

- Do not allow the application of herbicides during the Veteran's, Thanksgiving and Christmas holiday weekends Thursday through Sunday.
- The Pine Creek parking area, within the Scenic Drive would be used as the helicopter support area. This heli-base is paved and provides easy access from the Scenic Drive for fuel and water support and would serve as the base of operations where herbicide would be mixed according to label instructions and BLM BMPs, and the helicopter would be loaded, fueled, and secured when not in use.

4.3.10.2. Alternative B (Mechanical Mowing)

See Appendix D for avoidance measures and BMPs.

4.3.10.3. Alternative C (Mechanical Blading)

See Appendix D for avoidance measures and BMPs.

4.3.10.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.11. Socio-Economics

4.3.11.1. Proposed Action

While no Proposed Action mitigation measures are proposed for socio-economic resources, following the SOPs (see Appendix B), would help minimize impacts to people, communities, and human activities in the vicinity of the hazardous fuels reduction project.

4.3.11.2. Alternative B (Mechanical Mowing)

While no Alternative B (Mechanical Mowing) mitigation measures are proposed for socio-economic resources, implementation of the BMPs in Appendix D would help as minimization efforts on people, communities, and human activities in the vicinity of the hazardous fuels reduction project.

4.3.11.3. Alternative C (Mechanical Blading)

While no Alternative C (Mechanical Blading) mitigation measures are proposed for socio-economic resources, implementation of the BMPs in Appendix D would help as minimization efforts on people, communities, and human activities in the vicinity of the hazardous fuels reduction project.

4.3.11.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.12. Soils

4.3.12.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.12.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for the Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.12.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.12.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.13. Threatened, Endangered or Candidate Species

4.3.13.1. Proposed Action

Mitigation and avoidance measures for the Proposed Action are outlined in the BO in Appendix F and the BMPs in Appendix D.

4.3.13.2. Alternative B (Mechanical Mowing)

Mitigation and avoidance measures for Alternative B (Mechanical Mowing) are outlined in the BMPs in Appendix D.

4.3.13.3. Alternative C (Mechanical Blading)

Mitigation and avoidance measures for Alternative C (Mechanical Blading) are outlined in the BMPs in Appendix D.

4.3.13.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.14. Vegetation Excluding Federally Listed Species

4.3.14.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.14.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for the Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.14.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for the Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.14.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.15. Visual Resources

4.3.15.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.15.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.15.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.15.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.16. Wetlands/Riparian

4.3.16.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.16.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing). See Appendix D for avoidance measures and BMPs.

4.3.16.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading). See Appendix D for avoidance measures and BMPs.

4.3.16.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.17. Wild Horses/Burros

4.3.17.1. Proposed Action

See Appendix D for avoidance measures and BMPs.

4.3.17.2. Alternative B (Mechanical Mowing)

See Appendix D for avoidance measures and BMPs.

4.3.17.3. Alternative C (Mechanical Blading)

See Appendix D for avoidance measures and BMPs.

4.3.17.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.18. Wilderness

4.3.18.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs.

4.3.18.2. Alternative B (Mechanical Mowing)

There are no proposed mitigation measures for Alternative B (Mechanical Mowing).

4.3.18.3. Alternative C (Mechanical Blading)

There are no proposed mitigation measures for Alternative C (Mechanical Blading).

4.3.18.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

4.3.19. Wildlife Excluding Federally Listed Species

4.3.19.1. Proposed Action

There are no proposed mitigation measures for the Proposed Action. See Appendix D for avoidance measures and BMPs. Additional avoidance measures are outlined in the SOPs For Herbicide Application in Appendix B.

4.3.19.2. Alternative B (Mechanical Mowing)

- The impacts of Alternative B (Mechanical Mowing) may be reduced by thoughtful activity planning and methods (i.e. working in winter and not disturbing below the ground surface).
- The risk of creating degraded habitat can be reduced by targeting portions of the project area that would allow for removal while maintaining portions of viable habitat.

4.3.19.3. Alternative C (Mechanical Blading)

- To avoid this particular impact project managers will be in coordination with leaders of other projects throughout the treatment. Care will be taken when scheduling blading days or locations so as not to concentrate such activities so that wildlife, particularly small mammals, and reptiles have no routes nearby to move out of harm's way.

4.3.19.4. No Action Alternative

There are no proposed mitigation measures for the No Action Alternative.

Chapter 5. Monitoring Plan

The Red Rock Hazardous Fuels Reduction Project will implement adaptive management to address the various uncertainties associated with the outcomes of the herbicide treatment.

Without estimates of the quantity of brome species existing in the seed bank and with uncertain future climatic conditions contributing to brome establishment and population expansion, an adaptive management approach is best suited to the Proposed Action. This method will provide flexibility when delineating the areas within the Proposed Action that would require ongoing fuel reduction treatment(s) or native seeding in the years following the initial treatment.

Periodically during implementation of the Proposed Action effectiveness monitoring would be conducted to ascertain treatment outcomes, such as an increase or decrease in brome density. Based on the data collection and analysis, the selected action treatments will be modified to meet management objectives. For example, areas that are experiencing natural recruitment by native species may not undergo fuel reduction treatment the following year.

Following fuel reduction treatment(s) and interpretation of the survey results, management actions will be assessed to determine whether they met the desired objectives. Future application will be adjusted based on outcomes.

Quantitative sampling design:

Monitoring will be conducted once each year beginning one year prior to the initiation of fuel reduction treatment(s). When 80% of observed brome individuals have seed present annual sampling may commence. After treatments are complete areas will be monitored for no less than three years.

A minimum of 20 separate treatment segments and adjacent untreated land will be monitored. (The final number of replicates included in the study will be dependent upon the ultimately approved treatment configuration). Sampling will be stratified across two habitat-types: unburned and previously burned areas of blackbrush plant communities. Each one of five areas which were burned 4-6 years ago will be considered a treatment replicate within the burned habitat type. Areas of sampling within each of the two habitat types would also have associated “control” untreated sampling areas.

For the purposes of this monitoring protocol, 20 plots per treatment segment will be sampled. Ten permanent plots will be established in each herbicide treated area, and 10 will be established in untreated adjacent areas.

The sampling unit will be 1×1 meter square plot. Within each plot the percent cover of each species rooted within the sampling frame will be recorded. Sampling for species in addition to brome will assess whether other invasive species or native species are recruiting in open areas. Percent cover will be categorized based on areal cover of live and dead individuals rooted within the plot. Cover classes will be used: 1= trace, 2= 0-1%, 3= 1-2%, 4= 2-5%, 5= 5-10%, 6= 10-25%, 7= 25-50%, 8= 50-75%, 9= 75-95%, and 10= 95-100% (Peet et al. 1998). Additionally, the average height of each species (in cm) will be recorded. These values will be used to calculate a biomass index (cover×average height).

Management actions and strategies will be guided by fall germination and winter growth of brome, invasion by other noxious species and native species recruitment.

Chapter 6. Tribes, Individuals, Organizations, or Agencies Consulted:

Table 6.1. List of Tribes, Individuals, Organizations, or Agencies Consulted.

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
U.S. Fish and Wildlife Service.	Endangered Species Act Formal Section 7 Consultation for the experimental use of herbicides in very low, low and moderate density desert tortoise habitat. Request to Append the Herbicide Fuel Treatment Project in RRCNCA to the PBO for the RRCNCA (1–5–04–F-526), Clark County, Nevada.	If the mitigation measures are incorporated and herbicide use is restricted to USEPA regulations and label instructions, detrimental effects to the desert tortoise should be negligible.
Ms. Linda Otero, Fort Mojave Indian Tribe.	Potentially affected tribes were initially contacted via telephone and informed of the project as part of the development of the EA.	No known sites of religious or cultural importance to Native American tribes were identified.
Ms. Dorena Martineau, Paiute Indian Tribe of Utah.	Potentially affected tribes were initially contacted via telephone and informed of the project as part of the development of the EA.	No known sites of religious or cultural importance to Native American tribes were identified.
Mr. Charles Wood, Chemehuevi Indian Tribe.	Potentially affected tribes were initially contacted via telephone and informed of the project as part of the development of the EA.	No known sites of religious or cultural importance to Native American tribes were identified.

Chapter 7. List of Preparers

Table 7.1. List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Greg Marfil	Fire Management Specialist (Fire Planner)	Fuels/Fire Management and Health and Human Safety.
Sean McEldery	Supervisory Fire Management Specialist	Editing and reviewing sections.
Susan Farkas	Planning and Environmental Coordinator	Environmental Justice and Socio-Economics.
Marc Sanchez	Outdoor Recreation Planner	Maps
Fred Edwards	Botanist	Special Status Plant Species, Vegetation Excluding Federally Listed Species, and Woodlands/Forestry.
Krystal Johnson	Wild Horse & Burro Specialist	Wild Horses & Burros.
Jill Craig	Natural Resource Specialist	Invasive Species/Noxious Weeds and Maps.
Lauren Brown	Restoration Ecologist	Visual Resource Management.
Kathy August	Outdoor Recreation Planner	Recreation.
Boris Poff	Hydrologist	Floodplains, Hydrologic Condition, Soils, Water Resources/Quality, and Wetlands/Riparian Zones.
Sendi Kalcic	Wilderness Specialist	Wilderness/WSAs, and BLM Natural Areas.
Lisa Christianson	Environmental Protection Specialist	Air Quality.
Amelia Savage	Wildlife Biologist	Threatened, Endangered, or Candidate Animal Species; Fish & Wildlife Excluding Federally Listed Species; Special Status Animal Species; and Migratory Birds.
Billy Williams	Natural Resource Specialist	Maps. Technical Review and Assistance.
Lori Dee Dukes	Geologist	Project review.
Mark Boatwright	Archeologist	Project review.
Kerri-Anne Thorpe	Realty Specialist	Project review.
Mike Moran	Hazardous Materials	Project review.

Internal Review by Resource Specialists

Name	Resource/Specialty
Lisa Christianson	Air Quality and Greenhouse Gas Emissions.
Sendi Kalcic	Wilderness/WSAs, Areas with Wilderness Characteristics and BLM Natural Areas.
Mark Boatwright	Cultural Resources, Paleontology, and Native American Religious Concerns.
Amelia Savage	Wildlife, Migratory Birds, and Threatened & Endangered Animal Species.
Boris Poff	Hydrology and Soils.
Greg Marfil	Fuels and Fire Management.
Lori Dee Dukes	Geology and Minerals.
Jill Craig	Invasive Species/Noxious Weeds.
Kerri-Anne Thorpe	Lands and Access.
Kathy August	Recreation, and Wild and Scenic Rivers.
Fred Edwards	Botany, and Threatened & Endangered Plant Species, and Woodland/Forestry, Livestock Grazing, and Rangeland Health
Krystal Johnson	Wild Horses and Burros, and Farmlands.

Lauren Brown	Visual Resource Management.
Susan Farkas	Environmental Justice and Socio-Economics.
Mike Moran	Hazardous Materials.

Chapter 8. Other Material

8.1. Regulations, Orders and Laws

40 CFR 1500 through 1508. 1978. Regulations for Implementing the National Environmental Policy Act. Office of the Federal Register, National Archives and Records Administration, US Government Printing Office, Washington, DC.

Clean Air Act of 1970 (as amended in 1977 and 1990). 42 USC 7401 et seq. PL 91-604; 42-USC 1857h-7 et seq.

Clean Water Act. 1977 (as amended). 33 USC 1251-1387. PL 92-500.

Code of Federal Regulations (CFR). (Determining Conformity of Federal Actions to State or Federal Implementation Plans, 40 CFR 93.153).

Endangered Species Act. 1973 (as amended). 16 USC 1531 et seq. PL 93-205.

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Federal Land Policy and Management Act of 1976 (43 U.S. C. §§ 1701–1782, October 21, 1976, as amended 1978, 1984, 1986, 1988, 1990–1992, 1994 and 1996).

The Migratory Bird Treaty Act of 1918, as amended (16 USC 703 et seq.).

National Environmental Policy Act (NEPA). 1969 as amended. Public Law 91-190, 42 USC 4321-4347, Public Law 94-52, July 3, 1975, Public Law 94-83, August 9, 1975, and Public Law 97-258, § 4(b), Sept. 13, 1982.

National Historic Preservation Act of 1966 as amended. 16 USC 470a et seq. 80 Stat. 9`15; PL 89–665.

Federal Noxious Weed Act. 1975. Public Law 93-629. 7 USC 2801 et seq.; 88 Stat. 2148. January 3.

Public Rangelands Improvement Act of 1978. 43 USC 1901–1908. PL 95–514.

Red Rock Canyon National Conservation Area Establishment Act of 1990 (16 U. S. C. 460ccc–1(a)(2)).

Wild Free-Roaming Horses and Burros Act of 1971. PL 92-195.

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Brooks, M. L. 1999. Alien annual grasses and fire in the Mojave Desert. Madroño 46(1):13–19.

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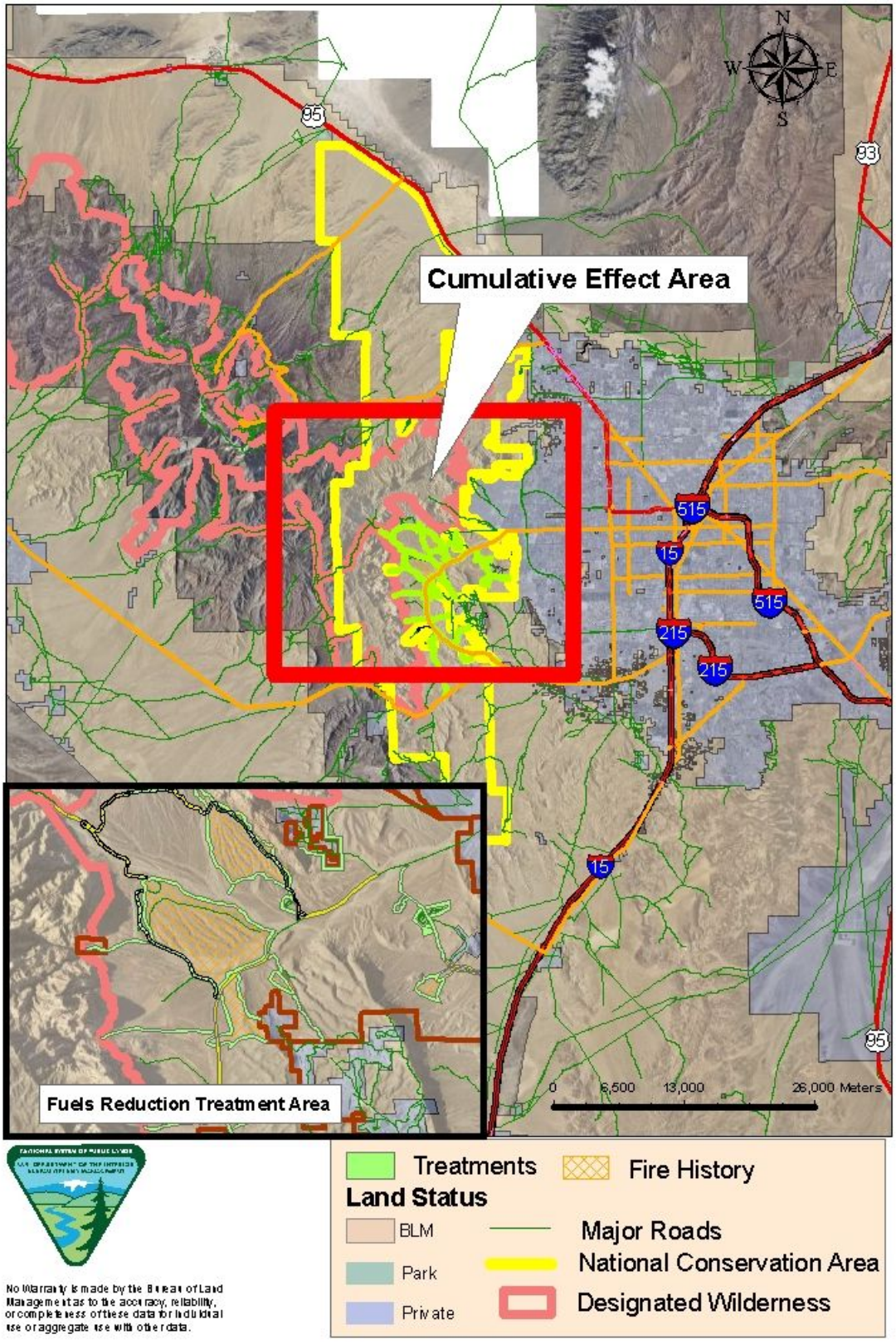
8.3. Acronym List

ATV	All-Terrain Vehicle
BMP	Best Management Practices
bgs	below ground surface
BO	Biological Opinion
BLM	United States Bureau of Land Management
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CPC	Center for Plant Conservation
DAQEM	Department of Air Quality and Environmental Management
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ES & R	Emergency Stabilization & Rehabilitation
FMU	Fire Management Unit
FRCC	Fire Regime Condition Class

FY	Fiscal Year
HHRA	Human Health Risk Assessments
HMA	Herd Management Area
HQ	Hazard Quotients
ISA	Instant Study Area
KOP	Key Observation Point
LUP	Land Use Plan
LVCVA	Las Vegas Convention and Visitors Authority
m.p.h.	Miles Per Hour
MSDS	Material Safety Data Sheet
NCA	National Conservation Area
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NRCS	Natural Resource Conservation Service
NSD	Nevada State Demographer
OHV	Off-Highway Vehicle
OIF	Outdoor Industry Foundation
ORWAG	Outdoor Recreation and Wilderness Assessment Group
PBO	Programmatic Biological Opinion
PEA	Programmatic Environmental Assessment
PEIS	Programmatic Environmental Impact Statement
PL	Public Law
PNC	Potential Natural Community
PPE	Personal Protective Equipment
RFFA	Reasonably Foreseeable Future Action
RMP	Resource Management Plan
ROD	Record of Decision
RRCNCA	Red Rock Canyon National Conservation Area
RV	Recreational Vehicle
SAR	Search and Rescue
SMRNA	Spring Mountains National Recreation Area
SNDO	Southern Nevada District Office
SOP	Standard Operating Plan
SRP	Special Recreation Permit
SWReGAP	Southwest Regional Gap Analysis Project
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
UTV	Utility Terrain Vehicle
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WSA	Wilderness Study Area
WUI	Wildland/Urban Interface

Chapter 9. Maps



Map 9.1. Red Rock Canyon Hazardous Fuels Reduction; Cumulative Effects Area

Appendix A. Comments and Response to Comments

Comment 1 Public Commenter

Comment 1-A: Fire Causes

The draft EA fails to discuss human fire starts, and how to prevent them.

Response 1-A:

The BLM appreciates the public's concern about human-caused fires. The purpose of this EA is to analyze the impacts from using herbicides to reduce fuel loads thereby minimizing the area threatened by each fire regardless of the cause. Reducing human-caused wildfire starts is important and BLM addresses this concern in the Fire Management Plan, available at the SNDO. Fire personnel at the SNDO address human fire starts by participating in Nevada Wildland Fire Prevention Week activities which includes staff information booths at the Clark County Fair and other outdoor community events. Also, BLM performs educational outreach programs for various schools in Clark County and enlists the help of the most recognizable fire prevention icon in the world - Smokey Bear. Each year in Clark County, Smokey Bear makes approximately 10,000 public contacts warning both kids and adults of the dangers of playing with matches, the dangers to human safety and property damage caused by unwanted wildfires, and both the negative and positive ecological impacts of wildland fires. Lastly, the BLM issues Fire Restriction Orders for the SNDO as a whole, including RRCNCA.

Comment 1-B: Fire Causes

How many fires have occurred during the month of July or after fireworks go on sale in Pahrump?

Response 1-B:

BLM prohibits the use of fireworks in the RRCNCA. We are not certain of the exact number of ignitions in RRCNCA that have occurred due to fireworks. Fireworks are a potential source of ignition for a wildfire; however, there are other sources of ignition that cannot be prevented such as lightning strikes. The project aims to reduce fuel loads through the use of herbicides and thereby reduce the area affected by wildfire after ignition, regardless of the cause.

Comment 1-C: Fire Restrictions

If people insist on purchasing fireworks with the temptation of blowing them off at Red Rock, then I would suggest that Route 159 be closed (except to residents and authorized personnel) for about three weeks during "fireworks season." If this is not possible, then at least close the loop road. The public needs to be educated and fire restrictions should be enforced, especially when the grasses become dry.

Response 1-C:

Thank you for your comment. Closing State Route 159 and the Scenic Drive could reduce human-caused fire starts in RRCNCA, however, there would be additional effects of closure, such as a loss of revenue for local tour groups and reduced visitation to RRCNCA. Unless danger is imminent, we have determined that closure would be inadequate to protect RRCNCA from

expansive wildfire. The EA was written to analyze the impacts from using herbicides to reduce fuel loads in order to reduce the area affected by wildfire. Usually from mid-May through September the SNDO enforces fire restrictions to reduce the potential of human-caused wildfire. Fire restrictions specifically ban fireworks on all BLM administered land.

Comment 1-D: Special Status Plant Species

How will you protect rare and endemic plants?

Response 1-D:

The measures detailed below will be taken to protect rare and endemic plants during the Red Rock Hazardous Fuel Reduction Project.

During the initial planning and design of the Red Rock Hazardous Fuels Reduction Project, BLM resource specialists including the BLM botanist provided comments and recommendations regarding the biological resources that may be potentially affected by the project. Specialists analyzed the potential for impacts to rare and/or sensitive plants within RRCNCA project boundaries. According to the EA the yellow two-tone beardtongue and the Blue Diamond cholla, both designated as BLM Sensitive Species, have the potential to occur within the project boundary. Based on the findings outlined in the EA the following steps have and/or will be taken to mitigate any effects to the rare and/or sensitive plant species:

The project is designed to avoid endemic plant species by treating 300 feet on just the east side of a portion of State Route 159, and not treating the north tip of the Scenic Drive (T. 20S, R. 58E Sect. 34). Specifically, washes within the project area which are documented yellow two-tone beardtongue habitat will be avoided.

In fall, prior to the Rare/Sensitive Plants Survey, initial site surveys were conducted by hiking the project footprint. Staff began cataloging sensitive biological resources such as sensitive and/or rare plants, and suitable habitat for sensitive and/or rare plants within the project area using handheld GPS units. An example of areas that were recorded is washes and disturbed areas that are the preferred yellow two-tone beardtongue habitat. This information was gathered to create maps and shape files for planning and design as well as the implementation phase of the project to prevent damage to biological resources including sensitive and/or rare plant populations.

Qualified biologists will conduct Sensitive and/or Rare Plant Surveys within and adjacent to the project area in the appropriate season to determine if rare plant(s) have the potential to occur. Project sites will be surveyed to determine the presence and suitable habitat of the following sensitive species: yellow two-tone beardtongue, Blue Diamond cholla, Spring Mountain milkvetch *(Astragalus remotus)*, alkali mariposa lily *(Calochortus striatus)*, and rough angelica *(Angelica scabrida)*. This survey follows a specific protocol required for NEPA/ESA Compliance for BLM Special Status Plant Species and will provide detailed observations so that sensitive areas can be avoided.

Also as mitigation for the loss of potential habitat and unidentified occurrences within the treatment areas, BLM would collect seed from populations at risk and the project would sponsor the addition of the yellow two-tone beardtongue to the CPC imperiled plant collection. As part of this sponsorship, the seed would be held in long-term conservation storage and a small annual stipend would be provided by the CPC in perpetuity to a member botanic garden for basic research on the species. This research would provide information regarding the species life

history, pollinator relationships, conservation genetics, and horticultural propagation. The one time sponsorship will cost the BLM approximately $15,000.

In addition to the listed mitigation actions, areas of high succulent/yucca/cactus density will be avoided and in cases where the threat of loss occurs species will be salvaged and replanted.

In Appendix B, SOPs for Herbicide Application, measures to avoid effecting non-target species (i.e. sensitive and/or rare plants) are outlined.

For further detail regarding the sensitive species present in RRCNCA and general mitigation measures please see Section 4.1.2 (BLM Sensitive Plant Species) and Appendix D (BMPs) in the EA.

Comment 1-E: Effectiveness Monitoring

Have "test plots" been used to see the results of the proposed activities in the long term?

Response 1-E:

This is the first time herbicide treatments have been utilized to this extent to control non-native annual grasses. Prior to project implementation test plots will be used to determine the tolerance of particular species as suggested by the herbicide label. When applying the initial treatments adjacent to native plants, small areas will be tested to determine the tolerance of each native species. This will help applicators gauge the sensitivity level of individual species. The buffer size surrounding native species will be adjusted according to test results thereby minimizing the loss of native species.

In addition to test plots used to minimize and/or avoid the loss of native species, an effectiveness monitoring plan has been developed to analyze the results of the proposed activities over the course of the project. Baseline data collection occurred in 2012.

A minimum of 20 separate herbicide treated segments and adjacent untreated land will be monitored so that long-term effects of herbicide application can be ascertained. The final number of samples collected will be dependent upon the ultimate treatment configuration. Sampling will be conducted in both unburned and burned areas since these areas are vastly different.

Additionally, each sampling plot will be photographed during monitoring to document changes in plant cover.

Comment 1-F: Invasive Plant Species

Has a survey been done to establish the extent of the spread of invasive species? Would you please provide a map?

Response 1-F:

The flammable annual grass species that are the focus of this project are pervasive and generally visible throughout the proposed project area. The highest concentrations occur in the burn scars.

The proposed project area was surveyed by The Interagency Weed Sentry Project (henceforth Weed Sentry), which was designed in 2003 to act as an early detection, rapid response program for invasive weeds on Clark County public lands including: National Park Service, U.S. Forest Service, USFWS, and BLM administered lands (Craig 2009).

The primary goal of the Weed Sentry was to collaborate with the aforementioned agency personnel to capture baseline information on the location and distribution of exotic plant invaders within public lands of Clark County and nearby vectors outside the county, and begin immediate control efforts on incipient weed populations.

In Fall 2009, the roads and trails were surveyed throughout RRCNCA. The *Interagency Weed Sentry Project: PROJECT REPORT 2008-2009 for Clark County, Nevada and the Multiple Species Habitat Conservation Plan* details the results and provides maps of the survey findings and the *Interagency Weed Sentry Trip Report: Report Date: November 26,* 2008.

This report is available online at: http://www.clarkcountynv.gov/Depts/dcp/Documents/Library/dcp%20reports/2010/20100115_Rept_fr_NPS_and_PLI_Weed_Sentry_Final_Project_Report.pdf

Comment 1-G: Invasive Plant Species

Explain the cause of the spread of invasive species.

Response 1-G:

Many of Nevada's noxious and invasive weeds came from regions in eastern Europe and western and central Asia with comparable climates. They were introduced through human activity, both accidentally and intentionally.

Cheatgrass is believed to have come to the west as a wheat seed contaminant. Salt cedar was planted along streams for erosion control. Purple loosestrife (*Lythrum salicaria, Lythrum virgatum*) was planted in gardens as an ornamental. In the intervening 100 years these species have spread to the extent that they are now noxious and invasive weeds.

Noxious and invasive weeds have a combination of traits that make them more competitive than natives. Tall whitetop (*Lepidium latifolium*), for example, produces thousands of seeds each year that can survive in the soil seed bank for 5 to 10 years. Along with its ability to reproduce by seed, this species is also rhizomatous. Rhizomes are underground stems with buds that can form new plants. Its roots can reach 20 feet deep in the soil. This combination of traits means that eradicating tall whitetop successfully requires years of treatment followed by decades of vigilance.

Cheatgrass is a winter annual that also produces a lot of seed. The seeds germinate in the fall, put up some leaves, and then in the spring they grow to maturity and produce seed. Few native species have life histories that are alike. Cheatgrass can initiate active growth at cooler soil temperatures than most natives. Thus, the early spring growth of cheatgrass occurs largely free of competition from other plants. Cheatgrass spring growth is completed before active growth begins for most native species. During drought cheatgrass can use all available soil moisture before native plant species begin growth. Cheatgrass is more responsive to fire than most natives. This combination of traits means that in drier years cheatgrass can grow, use all the available soil moisture, and set seed, while the native plants may not even break dormancy. Both prolonged drought and fire favors cheatgrass over many native plant species.

Also the spread of invasive annual grasses is exacerbated by the "annual grass/fire cycle." In years with weather favorable to cheatgrass, for example, it can fill in the natural open spaces between native shrubs. If a fire starts it spreads easily through these continuous fuels and can get much bigger than without cheatgrass. Many native plant species recover slowly from burns, while cheatgrass is adapted to respond quickly to the open space and the release of nitrogen and other nutrients following a burn. Native plant communities that once burned every 75 to maybe

250 years are now burning every five to ten years. Several repeated fires can remove many of the native species from the plant community.

Comment 1-H: Native Plant Species

Please do not kill native plants.

Response 1-H:

The BLM appreciates the public's concern about protecting native plants. The BLM's goal with this project is to protect native plants from unnatural fire. Reducing a flammable non-native annual grass will reduce the extent of damage caused by an individual wildfire; thereby, preserving native plants. The BLM understands that there is some uncertainty regarding how native plant species will respond to herbicide application; however, SOPs and BMPs are in place that will limit negative impacts to native species. As suggested by the herbicide label, when applying initial treatments adjacent to native plants small areas will be tested to determine the tolerance of each native species. This will help herbicide applicators gauge the sensitivity level of individual species thereby minimizing the loss of native species due to the effects of herbicide. The buffer size surrounding perennial native species will be adjusted according to test results. In addition to measures to protect existing native plants, the BLM plans to pursue future actions to seed the treatment areas with native species.

Comment 1-I: Threatened, Endangered, and Sensitive Species

Have threatened, endangered, and sensitive species been located on the ground?

Response 1-I:

Currently there are no Federally Endangered species identified within the project area. However the Blue Diamond cholla is a Federal candidate for listing. It is endemic to the Blue Diamond hills; however, Nevada Natural Heritage Program has recently downgraded the cholla to a "Watch List" species.

The desert tortoise is a federally threatened species that has the potential to occur within the project area. BLM conducted presence/ absence surveys between the mid-1980s and 1990, which consisted of triangular strip transects at random locations within suitable desert tortoise habitat throughout the Las Vegas District. Although the entire action occurs in potential desert tortoise habitat, pre-project surveys were not required because no new surface disturbance will be created by this project. The majority of the project area has been characterized as "low-density" tortoise habitat. Information regarding the range-wide status of the desert tortoise and its critical habitat including its listing history, species account, recovery plan, recovery and critical habitat units, distribution, reproduction, and numbers isprovided on the USFWS's website at: http://www.fws.gov/nevada/desert_tortoise/dt_life.html. If this website is unavailable, contact the USFWS Office in Las Vegas at (702) 515-5230, and provide File No. 84320-2012-F-0020.

Various sensitive species surveys are summarized in the Red Rock Canyon General Management Plan. The sensitive plant species have recently been surveyed "on the ground" by Great Basin Institute biologists and the results are available in the Red Rock Hazardous Fuels Reduction Project Rare/Sensitive Plant Survey (Williams 2012). Another BLM Sensitive species present at RRCNCA is the banded Gila monster. Although these have not currently been surveyed, they are not expected to be impacted.

For additional information, please see Appendix B (SOPs for Herbicide Application), Appendix D (BMPs) and Appendix F (BO) of the EA.

Comment 1-J: Threatened, Endangered, and Sensitive Species

How will they be protected?

Response 1-J:

General specifications have been set to protect threatened and sensitive species. Specifically, treatments will only occur during the fall/winter season to avoid wildlife sensitive seasonal times, such as bird breeding (March 1 - August 31), and desert tortoise season.

Other protection measures include:

- Avoidance of burrowing owl burrows will occur throughout the duration of the project by making certain no disturbance occurs within 50 m (approximately 160 ft.) of occupied burrows.
- The Worker Environmental Awareness Program will be administered to all on-site personnel identifying the sensitive biological or cultural resources known to occur in the project area, the appropriate BMPs required to reduce water quality impacts, and appropriate trash disposal and maintenance locations. The program will also emphasize restrictions such as no feeding wildlife, bringing domestic pets to the project site, collecting native plants, or harassing wildlife. Other topics will include:
    - Photos and habitat descriptions for special status species that may occur on the project site and information on their distribution, general behavior and ecology.
    - Species sensitivity to human activities.
    - Legal protections afforded the species.
    - Project BMPs for protecting species (i.e. looking under vehicles for tortoise).
    - State and federal law violation penalties.
    - Worker responsibilities for trash disposal and safe/humane treatment of special status species found on the project site, the associated reporting requirements, and specific required measures to prevent the take of threatened or endangered species.
    - Project site speed limit requirements and penalties.
- Project biologist will conduct clearance surveys prior to project activities each day to avoid sensitive resource disturbances.
- All activities will be confined to the designated work areas and the Project biologist will restrict access to sensitive areas.
- All vehicle traffic will be restricted to existing paved roads and the project alignment.
- Project biologist will maintain written records regarding implementation of biological resource BMPs and providing a summary of these records periodically in a report to the appropriate agencies.

In addition to the listed measures please see Appendix B (SOPs for Herbicide Application), Appendix D (BMPs) and Appendix F (BO) of the EA for further explanation of minimization measures to protect wildlife species.

Comment 1-K: Native Plants

If native plants are destroyed by herbicides or machines, which species of wildlife will suffer in the short or long term?

Response 1-K:

Native plants will be avoided during ground application of herbicide; therefore, the overall effects to wildlife are not expected to be significant.

In the case that mechanical treatments are the accepted alternative there will be native species removal, however, it will be limited to between 150 feet -300 feet and will not cause significant impacts to wildlife. Also, the effects may be reduced as only specific areas may undergo mechanical treatment through the implementation of integrated management (i.e. a combination of herbicide and mechanical treatments).

Please see section 3.3 (BLM Sensitive Wildlife Species), section 3.9 (Migratory Birds), section 4.1.3 (BLM Sensitive Wildlife Species), section 4.1.9 (Migratory Birds) and Appendix D (BMPs) of the EA for specific details.

Comment 1-L: Herbicides

How long do the herbicides stay active in the soil and water?

Response 1-L:

How long herbicides stay active in the soil is described by a herbicide's half-life, which indicates how long it takes for half of the applied herbicide to degrade. The rate of herbicide degradation depends on the environmental conditions it is exposed to, such as: soil pH, light, soil moisture and temperature.

Imazapic's reported half-life in soil ranges from 31 to 233 days, with an average half-life of 120 days. It is moderately persistent in soils, has limited horizontal mobility in soil, and has not been found to move laterally with surface water.

Glyphosate has a very short reported soil half-life of 47 days. Glyphosate binds readily with soil particles, which limits its movement in the environment, and it is relatively non-persistent in soil, has no soil residual activity, and does not appear to result in severe adverse impacts to soil.

The water table in the project area is too low, 400 to 500 feet below ground surface (bgs), for these chemicals to have any impact. Additionally, Imazapic and glyphosate will not be used in areas in which standing water is present.

Comment 1-M: Native Plants

Will native plants be able to grow after herbicides are applied?

Response 1-M:

We expect that most, if not all, native plants will be able to grow after treatments due to lack of competition with invasive grasses for resources. The herbicide label states that trees and brush that are under drought stress are susceptible to negative effects of the herbicide and may die. Current weather conditions in combination with each plant's unique life history have the potential to influence the plant's response to the herbicide. We suspect that once the herbicide has degraded to at least 50% there is potential for native plants to re-vegetate the site. However if natives are damaged or die, future management actions may be explored to seed treatment areas.

Comment 1-N: Native Plants

How many years will pass before plants can establish themselves again?

Response 1-N:

There is evidence that following the half-life of the applied herbicides there is potential for plants to re-vegetate the site. It is not certain the number of years that it will take for plants to establish themselves throughout the treatment areas because there are many contributing factors such as precipitation, competition, fire occurrence, etc., which may affect germination rates. Also, there is a level of uncertainty with the recruitment of native plants following fire events. There is the potential for the BLM to explore seeding treatment areas with native species in the future.

Comment 1-O: Herbicides

Will areas that are sprayed with herbicides become dominated by stronger weedy species in time?

Response 1-O:

It is possible that other invasive plant species could establish themselves on treated areas; however, the BLM is aware of this possibility and as stated in the EA will use an adaptive management approach to address these occurrences while they are small in scale. Roads and trails are known to be key locations for the establishment of new weed populations. Periodic fuel break monitoring would detect incipient weed populations and direct targeted treatment to prevent establishment. A separate EA will address the seeding of the treated areas with native plants to prevent this and aid native plant establishment.

Comment 1-P: Herbicides

Will herbicides reach the groundwater?

Response 1-P:

The herbicides will not reach the groundwater. The water table in the project area is too low, 400 to 500 feet bgs, for these chemicals to have any impact.

Comment 1-Q: Herbicides

Could the poison reach the springs and kill the springsnails?

Response 1-Q:

The herbicides will not affect the springsnails. Springsnails are found in Lost Creek, Willow Springs and Red Springs. A quarter mile buffer will be upheld around all springs in the project area to avoid impacts to springsnails.

In addition, please see Appendix B (SOPs for Herbicide Application), which states the avoidance measures for herbicide use.

Comment 1-R: Herbicides

Some people, including newborn babies, are more sensitive to chemical exposure than others. Have you given direct notice to households in the area regarding the proposal to use herbicides?

Response 1-R:

Public health and safety is of paramount importance to the BLM. To inform the public about this project the BLM held afternoon and evening public meetings at the RRCNCA Visitor Center on February 8, 2012. A public meeting notice was published in the local newspapers and postcards were sent to the RRCNCA interested parties mailing list inviting the public to attend and provide comments.

Comment 1-S: Herbicide Health Effects

Have they been told the potential health effects?

Response 1-S:

Human health and safety are discussed in the EA Sections 3.6 and 4.1.6.

Information on health effects can be found in the MSDS.

Genetic toxicity (Plateau® & Journey®)- *No mutagenic effect was found in various tests with microorganisms and mammals.*

Carcinogenicity (Plateau® & Journey®)- *In long-term studies in rats and mice in which the substance was given by feed, a carcinogenetic effect was not observed.*

Reproductive toxicity (Plateau® & Journey®)- *The results of animal studies gave no indication of a fertility impairing effect.*

Development (Plateau®)- *No indications of a developmental toxic/teratogenic effect were seen in animal studies.*

Development (Journey®)- *Causes developmental effects in animals at high, maternally toxic doses.*

Comment 1-T: Herbicides

How will you notify the general public if aerial application of herbicides is used?

Response 1-T:

A Federal Register Notice, multiple media releases and informational fact sheets would be utilized to inform the public of any closures due to aerial or ground applications of herbicide.

Comment 1-U: Biological Resources

There is a concern for rare birds, bats and butterflies. Are ground surveys complete?

Response 1-U:

Impacts to wildlife are analyzed in the EA. Please refer to the information available in Section 3.3 (BLM Sensitive Wildlife Species), Section 3.9 (Migratory Birds), Section 4.1.3 (BLM Sensitive Wildlife Species), Section 4.1.9 (Migratory Birds), and Appendix D (BMPs) of the EA.

Comment 1-V: Biological Resources

How will this proposal affect pollinators?

Response 1-V:

According to the MSDS for Plateau® and Journey® the Honey bee/LD50: >100ug/bee. *With high probability not acutely harmful to terrestrial organisms.*

Comment 1-W: Biological Resources

Will chemicals kill the animals that live under the ground?

Response 1-W:

Potential environmental effects can be found in the MSDS for Plateau® and Journey®. The statement for terrestrial toxicity states: *With high probability not acutely harmful to terrestrial organisms.*

Comment 1-X: Biological Resources

Which species or individuals will be at risk?

Response 1-X:

According to the MSDS both Plateau® and Journey® are: *With high probability not acutely toxic to terrestrial organisms.*

According to the MSDS for Plateau®: *There is a high probability that the product is not acutely harmful to aquatic invertebrates. Acutely harmful for aquatic plants. There is a high probability that the product is not acutely harmful to fish.*

According to the MSDS Journey® is: *Acutely harmful for aquatic organisms.*

Comment 2: Public Commenter

Comment 2-A: Herbicides

Do not use Glyphosate (aka Journey®) as an herbicide. It has a much longer latency period in the soils and has been linked to have carcinogenic properties in humans. However, lessening the proposed use from 32 grams per acre per year to a fraction of that could mitigate its environmental impact… Additionally, both Glyphosate and Imazapic gave unknown impacts to the water table; to reduce this impact the spray area should be lessened or eliminated around watersheds. This would negate all potential negative impacts to the biota of the area.

Response 2-A:

The BLM appreciates the public's concern about the use of herbicides. The BLM is unaware of any documented reports linking Journey® to having carcinogenic properties in humans. Glyphosate has a very short reported soil half-life of 47 days. Glyphosate is relatively

non-persistent in soil, has no soil residual activity, and does not appear to result in severe adverse impacts to soil (Tu et al. 2001).

The BLM used the results of Human Health Risk Assessments (HHRA) prepared by the U.S. Forest Service for Glyphosate. The U.S. Forest Service HHRA's presented the risk results as Hazard Quotients (HQ). HQ's were used to designate a risk level as no, low, moderate or high for ease of comparison (no risk is identified as an HQ >1, low risk is an HQ between 1 and 10, moderate risk is an HQ between 10 and 100, and high risk is an HQ greater than 100). Glyphosate was rated as 0 (no risk) to occupational and public receptors. Glyphosate was not identified as carcinogenic to workers or the public based on exposure scenarios evaluated in the Forest Service HHRA.

The water table in the project area is too low, 400 to 500 feet bgs, for these chemicals to have any impact.

Comment 2-B: Alternatives

Throw away alternatives B and C (Mowing). Aside from the 6-month operational schedule, the air impacts (as stated in the EA) and potential erosional forces in play could irreversibly damage the area.

Response 2-B:

The BLM is considering all alternatives or a combination of the alternatives. The Clark County Department of Air Quality & Environmental Management (DAQEM) has provided additional input regarding alternatives B and C and the BLM will consider the impacts to Air Quality from fugitive dust emissions. The BLM agrees that alternative C (Mechanical Blading) could result in increased erosion on and off-site. Please see Section 4.1.12 (Soils) in the EA for additional information.

Comment 2-C: Alternatives

Review the use of domestic livestock in eliminating non-native grasses. One possibility would be to use the proposed action until the grasses are in check, and then follow up seasonally with livestock. This would generate revenue for the surrounding ranchers and replenish trace minerals in the soil.

Response 2-C:

An alternative to reduce invasive annual grasses in the fuel break locations by use of domesticated cattle, sheep or goat grazing was considered but eliminated from detailed analysis due to non-conformance with the RRCNCA RMP and ROD (2005). There are no active grazing allotments within the RRCNCA.

Comment 2-D: Consultation

Include other agencies to weigh in on this project, especially the United States Geological Survey, to improve the data available regarding water and soil impacts due to herbicide use.

Response 2-D:

Other agencies providing input on this project include: USFWS (See Appendix F, BO), NDOW, and the Clark County (DAQEM). In addition, the U.S. Geological Survey has provided advice

and counsel from the early planning stages of the project. During the implementation phase of this project the BLM will continue to seek advice and counsel from other pertinent agencies.

Comment 3: All Vegas Horses, Alternatives

Years ago, wild mustangs were removed from the Blue Diamond area, where they would have naturally migrated into Red Rock to graze if fencing were not in place. The burn fuel that concerns the BLM is feed that could be maintained by allowing a small herd to rotate through the area, while providing a wonderful visual component and added tourist incentive to the park. Currently the herds adjacent to Cold Creek are becoming too numerous and hazardous. Could we not at least partially solve both problems by relocating some of the Cold Creek herd to the Red Rock area and allowing them to graze the burn hazard away?

Response 3:

Thank you for your comment. An alternative to reduce invasive annual grasses in the fuel break locations by use of wild horse and burro grazing was considered but eliminated from detailed analysis. The Red Rock HMA is located in southern Nevada within Clark County. The appropriate management level (AML) for the Red Rock HMA was established in 2004 as a population range of 29–49 wild burros and 16–27 wild horses.

Comment 4: Red Rock Audubon Society

Comment 4-A: General Opposition

Thank you for the opportunity to comment on the Red Rock Hazardous Fuel Reduction Project EA. While we feel strongly that it is appropriate to try and protect Mojave Desert ecosystems from unnatural wildfire we find that the EA for this project is seriously flawed and doesn't provide the necessary information needed for managers to make an informed decision about the proposed project.

Response 4-A:

The BLM maintains that the EA is a comprehensive analysis of all the alternatives. The BLM analyzed the potential environmental effects and considered each alternative in relation to the No Action alternative and the negative environmental impacts that catastrophic wildfire has on the non-fire adapted Mojave Desert ecosystem.

Comment 4-B: Safety (Opposition)

To begin with, the number one reason for the project: that "visitor and firefighter safety is the number one priority" in the Red Rock Canyon NCA is not supported by the enabling legislation, nor is it consistent with the reasons many visitors come to Red Rock Canyon NCA and engage in inherently hazardous activities such as rock climbing. The danger in making safety the number one priority is that it can lead to decisions which are inimical to the very resources which the NCA was designated to protect. While wildfire always poses a danger to humans in the vicinity we are not aware that visitors have had problems evacuating the area during past wildfire events.

Response 4-B:

Thank you for your comment. Although the enabling legislation, The RRCNCA Establishment Act of 1990, does not specifically state that, "Visitor and firefighter safety is the number one priority" it does state in Section 4. Management, sub-Section 2(C) Preventive Measures that,

"Nothing in this Act shall preclude such reasonable measures as the Secretary deems necessary to prevent devastating fire…within the conservation area." In addition, it directs the Secretary of the Interior to develop a general management plan for the conservation area. In 2005 the ROD was signed for the RRCNCA RMP which replaced the Interim General Management Plan (1995), which replaced the outdated Red Rock Canyon Recreation Master Plan (1976). In the RMP under Section 1 (Biodiversity), sub-section 1B.5 the management action is to: "Implement strategies to minimize habitat type conversion fires stemming from invasive exotic annual grasses." In addition, the project area is in FMU, Red Rock (Low Elevation) NV-050-06, in the Las Vegas Field Office Fire Management Plan (2004), which is tiered to the RMP. It states as a FMU objective to: "Protect human life, safety of wildland firefighters, and protection of human safety and health."

During past wildfire events— Loop (2005), Scenic (2006) and Bonnie Springs (2007)— there were difficulties evacuating visitors due to a limited number of law enforcement officers and a high number of visitors exacerbated by the one-way Scenic Drive. It should be noted that although past evacuations have not resulted in fatalities or serious injury there is no guarantee of safe evacuations in the future.

Comment 4-C: Alternatives (Opposition)

A firebreak functions by removing fuel and thus stopping the spread of fire. The three action alternatives discussed in the EA consist of creating firebreaks up to 300 feet wide by means of blading, mowing or use of herbicides. From the standpoint of visual resources the first two are non-starters while somehow the herbicide option is claimed to have no visual impact (p. 93, sect. 4.2.15.1). Glyphosate (trade name Journey®) is a broad spectrum herbicide that is designed to kill most living plants and if applied during the growing season will do just that. The visual impact of 300 foot wide brown strips will be very obvious, especially in spring, and change the character of the area. It needs to be noted that herbicide created fuel breaks are not effective until the existing plant material in the treated area weathers away, a process that takes several years, depending upon species composition. Until that time, herbicide killed vegetation actually increases the flammability of the area.

Response 4-C:

The BLM appreciates the concern about the potential visual impacts caused by herbicide application. In Section 4.1.15.1 the visual effect of herbicide use is addressed in the "Proposed Action" section:

"...Many visitors come to RRCNCA in the spring season to see wildflowers. Pre-emergent herbicide is expected to affect annual plant and wildflower bloom in the treated area for the duration of the treatment. Post-emergent herbicide would also affect native annual plants but is not expected to harm perennial shrubs. The lack of native annuals would create a moderate level of visual contrast with the characteristic landscape in the element of color for the period of time that treatments are occurring since herbicide application may prevent annual wildflower bloom. Some visitors may be affected by this if they are specifically looking for wildflowers. However, wildflowers may still be found in other locations within RRCNCA. After treatments are complete, the Proposed Action is expected to improve visual resources by reducing nonnative vegetation and the risk of wildfire damage and scars. A contrast rating of weak meets the VRM objectives for VRM Class II."

BLM acknowledges that the Proposed Action will have some effect on visual resources especially wildflower blooms. Plateau® is proposed for 300 foot fuel breaks along roads, trails and along

but not within terrain features such as washes. Plateau® does not target perennial shrubs and they would remain in the 300 foot fuel break. Invasive annual grasses would be reduced improving visual resources.

Glyphosate (Journey®) is only proposed to be used within existing fire scars that are already visually altered.

The herbicide Plateau® which is proposed for application to create 300 foot wide fuel breaks is a pre-emergent or post-emergent herbicide. If used as a pre-emergent there will be little to no invasive annual grass plant material remaining. If used as a post-emergent herbicide the timing of application will be when the invasive annual grasses are growing vigorously as they are sprouting before they reach full height.

Comment 4-D: Fire Behavior (Opposition)

An examination of the maps provided with the EA indicates that the polygons created by the proposed firebreaks are for the most part larger than any of the fires in recent history, thus giving no reason to think that the proposed firebreaks will mean that future fires will be any smaller or less destructive than past fires. No distinction is made in the EA between lightning caused fires and man-made fires, yet there are important distinctions. Lightning caused wildfires can start anyplace there is fuel and lightning strikes while man-made fires mostly start either along roads, due to discarded smoking materials or adjacent to camping areas, due to improper or illegal campfires.

Response 4-D:

The BLM appreciates the public's concern about whether this project will actually reduce the damage by future fires. The proposed fuel breaks will not necessarily guarantee smaller or less destructive fires in RRCNCA, however, the fuel breaks are designed to compartmentalize a wildfire whether it is "man-made" or lightning caused. The objective is to limit the spread of wildfire once it comes in contact with the fuel break and provide opportunities for firefighters to safely engage the fire at an anchor point before the rate of spread and flame lengths become too intense for them to safely engage the fire. During past wildfire events such as the Loop (2005), Scenic (2006), and Bonnie Springs (2007), fires became intense as a result of the lack of fuel breaks and easily "jumped" the Scenic Drive and State Route 159. The project design locates the proposed fuel breaks adjacent to roadways, as well as, within the interior areas of RRCNCA, thereby inhibiting both "man-made fires" as well as lightning caused fires throughout the RRCNCA.

Comment 4-E: Fire Behavior (Opposition)

Lightning caused fires are difficult to prevent and rather unpredictable. On the other hand human caused fires, other than arson, are predictable in terms of location and mostly preventable. A rather narrow strip of cleared ground immediately adjacent to roadways will prevent most fires from discarded smoking materials. The increased vegetation density at the edge of roadways due to increased storm water runoff and lack of competition is especially fire prone, but this area is very narrow, no more than 20 feet wide. Along the scenic loop there is no road shoulder in many areas and vegetation comes right up to the edge of pavement. This vegetation, which is at risk from human caused fire starts can be dealt with in a much less intrusive manner than proposed.

Response 4-E:

BLM recognizes that there are various causes of fire and agrees that they are unpredictable. BLM fire and fuels specialists have recommended up to 300 feet of treatment to address all types of fire starts and significantly reduce fine fuels. The proposed fuel treatments will specifically target invasive grasses, avoiding the shrubs while still accomplishing our fuel treatment goals. The reasons for a 300 foot treatment area are as follows:

- Reduction of portions of RRCNCA that are susceptible to fast moving fires
- Slow the spread of fire across the landscape.
- Provide firefighters the opportunity to safely fight fire. The reduction in these particular fuels not only provides firefighters with more time to coordinate evacuations but reduces response time for emergency responders, and law enforcement.

Lastly, BLM acknowledges that the vegetation directly adjacent to the road along the Scenic Drive poses a fire concern and has included this in the fuel treatments outlined by the project area maps.

Comment 4-F: Fuel Breaks (Opposition)

Firebreaks are only useful if they are maintained. In fact, the disturbance associated with creation of a firebreak will actually result in a proliferation of annual grasses within the firebreak area unless the area is maintained by either mechanical or chemical treatments on a regular basis. If there is no long term reliable funding source available, then creation of short term firebreaks will actually exacerbate fire danger in the long run due to the heavy growth of annual weeds and grasses that will occur within the disturbed areas.

Response 4-F:

The BLM appreciates the public's concern about the need to maintain these fuel breaks. One of the objectives of herbicide treatments is to reduce the soil seed bank of the invasive annual grasses thus hindering future germination of these grasses. Once fuel breaks are created the option of seeding these areas with native, less fire prone plants can be implemented thus reducing the interval between reinforcement applications. Future funding for hazardous fuels reduction can be obtained through National Fire Plan funding sources.

Comment 4-G: Fuel Breaks (Opposition)

The EA contains no examples of areas where this particular herbicide regime has been used and proven successful in a real world situation. The Red Rock Canyon NCA, considered one of the BLM's "crown jewels", is hardly the place for an experiment which will have significant negative visual impacts. It is true that herbicides will kill plants, including cheatgrass and red brome, but how that translates into a real reduction in flammability and fire starts is another question. BASF, the proposed herbicide provider, had a big roll-out of their proposed herbicide treatments for cheatgrass several years ago here in Las Vegas, mainly aimed at the northern part of the State, which eventually came to naught due to questions about its' long term effectiveness and cost. It seemed more like a plan to sell herbicide than to solve the real problem of cheatgrass proliferation and wildfire.

Response 4-G:

The BLM appreciates the public's interest in keeping the RRCNCA in a healthy, natural condition. The project's intent is to protect RRCNCA and its visitors so that the character of RRCNCA

is perpetuated for future generations to enjoy. This is why BLM is analyzing alternatives to protect RRCNCA infrastructure, protect and enhance natural vegetation and habitat, and reduce annual grass expansion. BLM will install fuel breaks with the intent not only to keep fire fighters safe but with the vision of providing protection for Mojave creosote-bursage desert scrub and blackbrush which are both poorly adapted to fire. This protection also perpetuates native species by protecting them from large scale fire events. The reduction in invasive annual grass and prevention of unwanted repeat fires provides opportunity for the recovery of federally threatened desert tortoise and decreases competition so that native species may thrive in areas previously characterized by invasive grasses.

The Red Rock Hazardous Fuels Reduction Project is proposing the use of herbicides both tested and approved for use by the Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States PEIS and ROD (2007). In addition, BLM will adhere to all USEPA regulations and the application guidelines provided on the herbicide label. For more information on minimization measures please see Appendix B (SOPs for Herbicide Application).

BLM recognizes the value of Visual Resources in conservation areas. According to the RRCNCA RMP and ROD (2005), scenic viewing is the activity that attracts the highest percentage of visitors to the area. A study completed in 1992 (ORWAG) found that even when involved in other activities, including biking/running, hiking, rock climbing and picnicking/day use, the primary reason for participating in these activities at RRCNCA is the scenery. To address the concern of "*significant negative visual impacts*" please refer to the following passage taken from the EA provided by the BLM Visual Resource Specialist:

". . . . Since RRCNCA is primarily visited for its scenic quality, the level of sensitivity to contrast in visual resource values is high. Many visitors come to RRCNCA in the spring season to see wildflowers. Pre-emergent herbicide is expected to affect annual plant and wildflower bloom in the treated area for the duration of the treatment. Post-emergent herbicide would also affect native annual plants but is not expected to harm perennial shrubs. Contrast Analysis Ratings from all five KOPs showed an overall weak level of contrast with the surrounding landscape. Landform and structures would not be affected by the Proposed Action. Vegetation would have weak levels of contrast in the elements of form, line, and texture. The lack of native annuals would create a moderate level of visual contrast with the characteristic landscape in the element of color for the period of time that treatments are occurring since herbicide application may prevent annual wildflower bloom. Some visitors may be affected by this if they are specifically looking for wildflowers. However, wildflowers may still be found in other locations within RRCNCA. After treatments are complete, the Proposed Action is expected to improve visual resources by reducing nonnative vegetation and the risk of wildfire damage and scars. A contrast rating of weak meets the VRM objectives for VRM Class II."

It is important to note that the project is not intended to reduce fire starts. There are other BLM initiatives and actions tasked with prevention. The project objective is to reduce the threat of unwanted wildland fire in RRCNCA due to invasive annual grasses by the creation of fuel breaks (otherwise called fuel treatments) by application of herbicide.

Comment 5: Nevada Department of Wildlife

Comment 5-A: General Support

The Department supports the restoration of the treatment areas with native Mojave Desert vegetation that will be beneficial to wildlife habitat. A vegetation restoration plan targeted to

desert tortoise inclusive of the appropriate native grasses and forbs is recommended along with a schedule for vegetation restoration monitoring and maintenance. Avoidance of herbicide application during the breeding season for all wildlife (March through late-June to July) is also recommended.

Response 5-A:

Seeding with native plants is a planned future action to reduce the persistence of invasive annual grasses and has the added benefit of providing suitable wildlife habitat. The BLM has written an effectiveness monitoring plan which will be implemented prior to treatments and continue through at least 2015.

If approved, herbicide application would target invasive annual grasses from November through February.

Comment 5-B: Wildlife Mitigation Measures

With measures implemented to avoid conservation conflicts with species similar to the desert tortoise, inclusion of the Department's Gila monster protocol as part of project worker education and monitoring is recommended.

Response 5-B:

The BLM agrees and will incorporate the Department's banded Gila monster protocol as part of project worker education and monitoring as recommended. See Appendix D (BMPs) of the EA.

Comment 6: Las Vegas Climbers Liaison Council

Comment 6-A: Recreation

My concerns/questions are mainly with regards to recreation access. Assuming that the preferred alternative becomes the final one, the draft mentions closing the Scenic Drive temporarily while the helo is used. What type and amount of advance notification will be given to the public and permittees?

Response 6-A:

The closures will be published in the Federal Register in advance. In addition, the BLM will provide continual advanced notification of closures through the media and postings at the RRCNCA Visitor Center.

Comment 6-B: Recreation

Similar question with regards to the use of Pine Creek parking as the helo base. Again, having to do with recreation access.

Response 6-B:

See the response to comment 6-A.

Comment 6-C: Safety

Will there be MSDSs available at the visitor center or administrative office?

Response 6-C:

MSDS will be available at both the RRCNCA Visitor Center and the BLM SNDO.

Comment 7: Clark County Department of Air Quality & Environmental Management (DAQEM)

Comment 7-A: General Support

The Proposed Action (Alternative A) is to use two herbicides to treat and reduce the amount of non-native invasive annual grasses and their seed bank to create fuel breaks. DAQEM supports the Bureau of Land Management's (BLM) proposed action because there would be no impact on air quality.

Response 7-A:

Thank you for your comment. Comment noted.

Comment 7-B: Air Quality

The BLM has proposed two (2) additional methods of treating and reducing the amount of non-native invasive annual grasses and their seed bank, as well as a "no action" alternative. More specifically, alternative B would remove hazardous fuels by mowing while alternative C would remove hazardous fuels by mechanical blading. The impact of alternative B on air quality would be a temporary increase in fugitive dust emissions in the project area; however, the increase would be negligible. The impact of alternative C would likely cause more significant and longer term increases in fugitive dust emissions due to the additional soil disturbance in the project area.

Response 7-B:

Maintaining air quality standards is important to BLM. The BLM will further address Air Quality issues for Alternatives B and C, specifically fugitive dust emissions, in the EA.

Comment 8: Desert Conservation Program, General Support

The project has the potential to greatly reduce the risk of human-caused wildfire spread and damage in the Bureau of Land management (BLM) Red Rock National Conservation Area, which provides habitat for many native species, including the threatened Desert tortoise. The project takes a balanced approach to minimize the immediate impacts of the fuel break creation in the preferred alternative on rare plant taxa, such as the yellow two-tone beardtongue.

Response 8:

The BLM agrees, but notes that the purpose of the EA is to address the creation of fuel breaks to limit the spread of a wildfire no matter the cause. See also response to comment 1-D.

Comment 9: Public Commenter, Hazardous Fuels

What does Hazardous Fuels Reduction Treatments mean?

Response 9:

Hazardous fuel is vegetation that promotes the spread and intensity of a wildland fire. Treatments are methods to reduce this fuel usually by applying prescribed fire, herbicides, or some kind of

mechanical method such as blading, mowing or sawing. Specifically to this EA the BLM is seeking to address the problem of non-native invasive grasses (i.e. red brome and cheatgrass) by treating these fuels with herbicides (Proposed Action) or mechanical mowing or mechanical blading or a combination of these methods.

Appendix B. Standard Operating Procedures For Herbicide Application

Standard Operating Procedures For Herbicide Application

Application Method and Requirements

Only BLM Approved Herbicides will be used for the Project. Herbicides used on the project could be applied by helicopter or by hand using a backpack sprayer supported by UTVs. Treatments will be applied in the fall or winter according to label direction.

Any herbicide application will be done by a State Licensed Herbicide Applicator using standard-approved application techniques.

All herbicide treatments will follow BLM procedures outlined in BLM Handbook H-9011-1 (Chemical Pest Control), and manuals 1112 (Safety), 9011 (Chemical Pest Control), and 9015 (Integrated Weed Management), and will meet or exceed state label standards. Treatments will comply with the USEPA label directions as required by the Federal Insecticide, Fungicide and Rodenticide Act.

Re-applications of the herbicide will not be less than the persistence factor identified for the herbicide.

Buffer Zones

Application of herbicide by a helicopter will not occur in washes or within one-hundred feet from any existing open water sources (creek, cattle troughs, lakes, and ponds). Application of any type of herbicide by backpack sprayer will not occur in washes or within fifty feet of any existing open water source. All label specific requirements will be adhered to, including the avoidance of areas where groundwater is expected at five feet or less bgs. Application of herbicide will not occur within two-hundred feet of any known current or historic Penstemon habitat.

Project Inspection

A BLM approved Project Inspector will be on site within the project area at all times while the herbicide is being applied and will be responsible for ensuring that the treatment is applied as directed. Chemical label directions will be followed. BLM procedures and methods will be followed as set forth in the Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States PEIS and ROD (2007).

Storage and Mixing of Herbicide

No hazardous materials shall be stored or disposed of on-site. Fuel, oil, and grease needed for equipment maintenance during the working period may be stored on site where no leakage or spillage will contaminate the ground. Any spilled materials will be immediately cleaned up and disposed of and the BLM Project Inspector will be notified of the spill. No equipment maintenance, rinsing, or mixing of chemicals will be performed within, or near, any stream channel or waters where chemicals, petroleum products or other pollutants from equipment may enter these waters. Herbicides will not be stored on the project site. Product label directions and MSDSs will be available on site for reference in case of spill or exposure. All unused herbicides

or empty containers will be disposed of by the licensed herbicide applicator in accordance with the USEPA label at an approved disposal site.

Weather Restrictions

Wind velocities for herbicide applications must be 10 m.p.h. or less in all instances to reduce drift potential. Herbicide application will not occur during precipitation events. It may occur 48 hours before or after precipitation events according to label direction.

Appendix C. Noxious Weed List

Noxious Weed List

NAC 555.010 Designation and categorization of noxious weeds.

DEFINITIONS

Category ”A”: Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations.

Category "B": Weeds established in scattered populations in some counties of the state; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur.

Category "C": Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer.

Common Name	Scientific Name
Category A Weeds	
African Rue	*Peganum harmala*
Austrian fieldcress	*Rorippa austriaca*
Austrian peaweed	*Sphaerophysa salsula*
Black henbane	*Hysocyamus niger*
Camelthorn	*Alhagi pseudalhagi*
Common crupina	*Crupina vulgaris*
Dalmatian toadflax	*Linaria dalmatica*
Dyer’s woad	*Isatis tinctoria*
Eurasian water-milfoil	*Myriophyllum spicatum*
Giant reed	*Arundo donax*
Giant salvinia	*Salvinia molesta*
Goats rue	*Galega officinalis*
Green fountain grass	*Pennisetum setaceum*
Houndstongue	*Cynoglossum officinale*
Hydrilla	*Hydrilla verticillata*
Iberian starthistle	*Centaurea iberica*
Klamath weed	*Hypericum perforatum*
Malta starthistle	*Centaurea melitensis*
Mayweed chamomile	*Anthemis cotula*
Mediterranean sage	*Salvia aethiopis*
Purple loosestrife	*Lythrum salicaria, Lythrum virgatum* and their cultivars
Purple starthistle	*Centaurea calcitrapa*
Rush skeletonweed	*Chondrilla juncea*
Sow thistle	*Sonchus arvensis*
Spotted knapweed	*Centaurea maculosa*
Squarrose knapweed	*Centaurea virgata*
Sulfur cinquefoil	*Potentilla recta*
Syrian bean caper	*Zygophyllum fabago*
Yellow starthistle	*Centaurea solstitialis*
Yellow toadflax	*Linaria vulgaris*
Category B Weeds	
Carolina horse nettle	*Solanum carolinense*

Diffuse knapweed	*Centaurea diffusa*
Leafy spurge	*Euphorbia esula*
Medusahead	*Taeniatherum caput-medusae*
Musk thistle	*Carduus nutans*
Russian knapweed	*Acroptilon repens*
Sahara mustard	*Brassica tournefortii*
Scotch thistle	*Onopordum acanthium*
White horse nettle	*Solanum elaeagnifolium*
Category C Weeds	
Canada thistle	*Cirsium arvense*
Hoary cress	*Cardaria draba*
Johnson grass	*Sorghum halepense*
Perennial pepperweed	*Lepidium latifolium*
Poison Hemlock	*Conium maculatum*
Puncture vine	*Tribulus terrestris*
Salt cedar (tamarisk)	*Tamarix spp..*
Water Hemlock	*Cicuta maculata*

Appendix D. Best Management Practices

Planning

BLM requirements and RRCNCA RMP and ROD (2005) conformance are addressed and incorporated into the project design.

Local agency requirements, including but not limited to local zoning, general plan policies, land use, water, hydrology, safety, aesthetics, traffic, and height restrictions, are accounted for in the project description. The project is consistent with zoning ordinances and general plan designations.

Biological resource surveys will be completed during the appropriate seasons consistent with agency approved survey protocols. Multiple follow up surveys may be implemented based on rainfall, weather, and adequacy of initial surveys during the spring and fall seasons.

The BLM will coordinate with the appropriate agencies to develop and institute avoidance, minimization, and mitigation measures prior to proceeding with project activities that could effect sensitive resources.

Avoidance Measures for Cumulative Effects

To decrease cumulative impacts the Red Rock Hazardous Fuels Reduction Project manager will coordinate within BLM, and other agencies to schedule treatments that will minimize cumulative impacts.

Project coordination will be used when scheduling activities and locations in order to avoid concentrated work areas. When possible these efforts will provide wildlife, particularly small mammals, and reptiles with increased opportunities and routes to move out of harm's way.

Sensitive/Endemic Plant Species

The project is designed to avoid endemic plant species by treating 300 feet in from just the east side of a portion of State Route 159 and not treating the north tip of the Scenic Drive (T. 20S, R. 58E Sect. 34). More specifically washes within the project area, documented yellow two-tone beardtongue habitat will be avoided.

Qualified biologists will conduct rare plant surveys within and adjacent to the project area in the appropriate season to determine if rare plant(s) have the potential to occur.

Project biologists will conduct pre-treatment clearance surveys for sensitive/endemic species within the project area prior to project activities.

Areas of high succulent/yucca/cactus density will be avoided. Where threat of loss occurs these species will be reclaimed or replanted.

Recreation

When applicable, areas of the Scenic Drive will be treated aerially, limiting the time that the area must be closed to public.

Employees and Contractors will set up signage describing activities and locations in order for visitors to be informed of areas to be avoided throughout treatment areas and minimize

the disruption of recreational activities. MSDSs will be available, for the public, at both the RRCNCA Visitor Center and the SNDO.

Implementation

The Worker Environmental Awareness Program will be administered to all on-site personnel identifying the sensitive biological or cultural resources known to occur in the project area, the appropriate BMPs required to reduce water quality impacts, and appropriate trash disposal and maintenance locations. The program will also emphasize restrictions such as no feeding the wildlife, bringing domestic pets to the project site, collecting native plants, or harassing the wildlife. Other topics will include:

- Photos and habitat descriptions for special status species that may occur on the project site and information on their distribution, general behavior and ecology.
- Species sensitivity to human activities.
- Legal protections afforded the species.
- Project BMPs for protecting species (i.e. looking under vehicles for tortoise)
- State and federal law violation penalties.
- Worker responsibilities for trash disposal and safe/ humane treatment of special status species found on the project site, associated reporting requirements, and specific required measures to prevent taking of threatened or endangered species.
- Project site speed limit requirements and penalties.

Project biologist will conduct clearance surveys prior to project activities each day to avoid sensitive resources disturbances.

All activities will be confined to the designated work areas and the Project biologist will restrict access to sensitive areas.

All vehicle traffic will be restricted to existing paved roads and the project alignment

Project biologist will maintain written records regarding implementation of biological resource BMPs and providing a summary of these records periodically in a report to the appropriate agencies.

Wild Horses/Burros

Treatments will occur during the fall/winter season avoiding wild horse and burro foaling season.

Individuals will not exceed 25 m.p.h. speeds throughout the HMA. Individuals will remain at least 0.25 miles from the water sources in the HMA, to prevent unnecessary stress on the animals. Wild horses/burros will be avoided if found in the treatment area. Individuals will not harass (feed, pet, chase, etc.) wild horses and burros if encountered on or near the treatment areas, trails, or equipment parking areas.

Wildlife

Treatments will occur during the fall/winter season avoiding wildlife sensitive seasonal times, such as migratory bird, bird breeding (March 1 - August 31), and desert tortoise season.

Avoidance of burrowing owl burrows will occur throughout the duration of the project by making certain no disturbance occurs within 50 m (approximately 160 ft.) of occupied burrows.

Desert Tortoise

The minimization measures as stated in the USFWS BO will be strictly adhered to. (see appendix F).

Gila Monster

The NDOW banded Gila monster protocol as part of project worker education and monitoring will be incorporated.

Cultural Resources and Native American Concerns

The cultural resource inventory was completed on April 13, 2012. There are no expected impacts to significant cultural resources under this action. If deemed necessary, associated activities may need to be situated off of significant cultural resources. If significant cultural resources are present a Historical Treatment Plan will be developed in coordination with the Nevada State Historic Preservation Office and the affected tribe(s) prior to implementation.

Paleontological Resources

No treatment would occur in the immediate area of significant remains; however, if identified, associated activities may need to be situated away from paleontological resources. If significant paleontological resources are identified during herbicidal treatment, work will stop in the immediate proximity of the find, and affected tribes and the Nevada State Historic Preservation Officer will be notified.

Herbicide

- The use of herbicides and all adjuvants for this project will necessitate a Pesticide Use Permit to be submitted to the SNDO Weed Coordinator no less than one month prior to application for routing and state approval. (Appendix B).
- A Pesticide Application Report must be completed for monitoring within 24 hours of application and submitted to the SNDO Weed Coordinator within one week of application. (Appendix B).
- Employees and equipment must be clean and free of soil and vegetation prior to commencing the Proposed Action.

All applicators will carry required credentials for the State of Nevada.

Label specifications will guide helicopter, backpack sprayer, herbicide, adjuvant and drift inhibitor usage along with PPE, application rate, coverage, mixing methods, and droplet size to reduce runoff and drift.

All project related vehicles and equipment will be maintained in proper working condition to minimize fugitive emissions and accidental motor oil, antifreeze, hydraulic fluid, grease, or other

fluids or hazardous materials spills. At the time of occurrence all waste leaks, spills, or releases will be cleaned up and properly disposed of at the approved off site disposal facilities. Equipment and site damages will be immediately repaired.

Fueling and maintenance activities will occur outside of streams and wetlands, a minimum of 100 feet from riparian and wetland habitats, and in areas where accidental fuel spills will not flow into waters.

Contractor will provide a spill prevention and response plan identifying where waste materials are stored on site, spill prevention measures to be implemented, training requirements, appropriate spill response actions for each material or waste, the locations of spill response kits on site, a procedure for ensuring that the spill response kits are adequately stocked at all times, and procedures for making timely notifications to authorities.

Contractor will stage all materials and equipment in designated areas only.

Measures will be taken to reduce and/or limit vehicular and equipment traffic to existing routes of travel. Refueling and vehicular-maintenance activities and storage of materials will be located in areas already impacted by vehicular parking and disturbance.

These herbicides are for terrestrial use only and will not be applied directly to water or to areas where surface water is present or in washes.

Herbicide will not be applied if the following condition(s) are present:

- Rain.
- Rain is forecasted within 48 hour of application.
- Wind speeds in excess of 10 m.p.h.

Appendix E. Fire Regime and Condition Class

Table E.1. General Description of Fire Regime

Group	Frequency	Severity	Severity Description
I	0–35 years	Low/mixed	Generally low severity fires replacing less than 25% of the dominant over-story vegetation; can include mixed-severity fires that replace up to 75% of the over-story
II	0–35 years	Replacement	High-severity fires replacing greater than 75% of the dominant over-story vegetation
III	35–200 years	Low / mixed	Generally mixed-severity; can also include low-severity fires
IV	35–200 years	Replacement	High-severity fires
V	200+ years	Replacement / any severity	Generally replacement severity; can include any severity type in this frequency range

Note: These regime groups have been modified slightly from earlier versions (Schmidt et al. 2002 and FRCC Guidebook Version 1.2.0) to remain consistent with the ongoing LANDFIRE Project (specifically, Fire Regime III now includes low-severity fires and Fire Regime V includes fires of any severity type).

Table E.2. Fire Regime Red Rock Low Elevation (LE) Desert Shrub: Fire Regime V; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050–06		Red Rock Canyon National Conservation Area (LE)	
Condition Class	**Fire Regime**	**Acres**	**Percent**
2	II	71,026	47.6
	V	58,510	39.2
3	I	4,166	2.8
	II	5,896	3.9
	IV	9,690	6.5
Total		149,289	

Appendix F. Biological Opinion